

**NATURAL RESOURCES DEFENSE COUNCIL'S & POWDER RIVER BASIN
RESOURCE COUNCIL'S PETITION FOR REVIEW**

EXHIBIT 12

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD PANEL
HEARING

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In the Matter of: : Docket No. 40-9091-MLA
STRATA ENERGY, INC. :
: ASLBP No.
(Ross In Situ Recovery : 12-915-01-MLA-BD01
Uranium Project) :

-----x

Tuesday, September 30, 2014

Wyoming Meeting Room
Energy Hall
CAMP-PLEX Multi-Event
Facilities
1635 Reata Drive
Gillette, Wyoming

BEFORE:

G. PAUL BOLLWERK, III, Chairman
DR. RICHARD F. COLE, Administrative Judge*
DR. CRAIG M. WHITE, Administrative Judge

*present via teleconference

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TABLE OF CONTENTS

1			
2	Contention 1		
3	Opening Statements:		
4	Christopher Pugsley, SEIS		283
5	Emily Monteith, NRC staff		289
6	Shannon Anderson, joint intervenors		293
7	Board Questions		307
8	<u>WITNESSES</u>		<u>PAGE</u>
9	Strata Energy		297
10	NRC Staff		370
11	Joint Intervenors		400
12	<u>Exhibits</u>	<u>Identified</u>	<u>Received</u>
13	SEI001, SEI002, SEI003, SEI004A,	305	306
14	SEI004B, SEI005, SEI006, SEI007,		
15	SEI008, SEI009A, SEI009B, SEI010,		
16	SEI011, SEI012A, SEI012B, SEI013,		
17	SEI014A, SEI014B, SEI014C, SEI014D,		
18	SEI014E, SEI014F, SEI014G, SEI014H,		
19	SEI014I, SEI014J, SEI014K, SEI014L,		
20	SEI014M, SEI014N, SEI014O, SEI014P,		
21	SEI015, SEI016A, SEI016B, SEI016C,		
22	SEI016D, SEI016E, SEI017, SEI018,		
23	SEI019, SEI020A, SEI020B, SEI020C,		
24	SEI020D, SEI020E, SEI020F, SEI020G,		
25	SEI021, SEI022, SEI023, SEI024, SEI025,		

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1	SEI026, SEI027, SEI028, SEI029, SEI030,		
2	SEI031, SEI032, SEI033, SEI034, SEI045,		
3	SEI046, SEI047, SEI050, SEI051, SEI052		
4	SEI053		
5	NRC001 and NRC044-R2	374	374
6	NRC002, NRC003, NRC004, NRC005,	378	378
7	NRC006A, NRC006B, NRC007, NRC008,		
8	NRC009, NRC010, NRC011, NRC012,		
9	NRC013, NRC014, NRC015, NRC016-R,		
10	NRC017, NRC018, NRC019, NRC020,		
11	NRC043, NRC045, NRC046, NRC047		
12	JTI001-R, JTI002, JTI006, JTI009,	408	408
13	JTI010, JTI011, JTI012, JTI013,		
14	JTI014, JTI015, JTI016, JTI017,		
15	JTI018, JTI019, JTI020, JTI021,		
16	JTI027, JTI028, JTI047, JTI048,		
17	JTI049, JTI050, JTI051-R		
18			
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P-R-O-C-E-E-D-I-N-G-S

9:31 A.M.

1
2
3 CHAIRMAN BOLLWERK: Good morning. Let me
4 begin by introducing ourselves this morning. To my
5 right is Dr. Craig White. Judge White is a geologist
6 and a part-time member of the Atomic Safety and
7 Licensing Board Panel. My name is Paul Bollwerk. I'm
8 an attorney, a full-time panel member, and the chair
9 of this Atomic Safety and Licensing Board.

10 A second technical member of this Board is
11 Judge Richard Cole. Judge Cole is an environmental
12 engineer and a full-time member of the Atomic Safety
13 and Licensing Board Panel. Although recent health
14 problems have precluded Judge Cole from traveling to
15 Wyoming for this week's session, he will be
16 participating via video and teleconference in this
17 evidentiary hearing.

18 At this point, Judge Cole, if you could
19 say hello, I hope we can see your picture here in the
20 hearing room.

21 JUDGE COLE: Hello, everybody. I hope
22 your weather out there is pleasant. I understand you
23 had a little rain yesterday. I'm surprised it wasn't
24 snow.

25 CHAIRMAN BOLLWERK: Actually, we had a

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1 little more rain this morning. But it wasn't snow.

2 JUDGE COLE: That's good.

3 CHAIRMAN BOLLWERK: All right, thank you
4 very much, Judge Cole.

5 Each of us is an independent
6 Administrative Judge appointed by the five member
7 Nuclear Regulatory Commission as members of the Atomic
8 Safety and Licensing Board Panel. Members of the
9 Panel are designated by the Agency's Chief
10 Administrative Judge acting at the behest of the
11 Commission to serve on three Judge Licensing Boards
12 such as this one that preside over hearings in which
13 the Atomic Energy Act permits a hearing to be held
14 relative to the construction or operation of nuclear
15 power plants, use of nuclear materials, or the storage
16 of nuclear waste.

17 The Panel's Administrative Judges do not
18 work for or with the NRC staff relative to the staff's
19 own review of licensing and enforcement matters.
20 Rather, we are charged with deciding the first
21 instance what issues will be litigated in the hearing
22 and to those issues we find litigable, making a
23 determination regarding their substantive validity in
24 terms of granting, conditioning, or denying the
25 requested license or sustaining or modifying the

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1 proposed enforcement action.

2 Our decisions on hearing matters generally
3 are subject to review first by the Commission, as the
4 Agency's Supreme Court, and then by the Federal Courts
5 including in appropriate instances, the United States
6 Supreme Court.

7 This Licensing Board is here today to
8 conduct an evidentiary hearing regarding the
9 application submitted by Strata Energy, Inc., or SEI,
10 in January 2011, requesting issuance of a combined
11 Atomic Energy Act or AEA Section 11(z) source and
12 Section 11(3)(2) byproduct materials license that
13 would authorize the construction and operation of the
14 Ross in situ recovery or ISR Uranium Project in Crook
15 County, Wyoming.

16 In July 2011, the Commission issued a
17 notice in Volume 76 of the Federal Register at page
18 41,308, outlining the process for becoming a party in
19 a hearing contesting the SEI application. And two
20 public interest groups, the Natural Resources Defense
21 Council and the Powder River Basin Resource Council,
22 filed a joint intervention petition challenging
23 various aspects of the SEI application and the
24 accompanying environmental report, or ER.

25 In a February 2012 decision, LBP 12-3

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1 reported in Volume 75 of the Nuclear Regulatory
2 Commission Issuances at page 164, the Board found that
3 joint intervenors had established their standing or
4 legal interest in this proceeding and it proffered
5 four admissible National Environmental Policy Act, or
6 NEPA, related environmental contentions. A decision
7 of the Commission subsequently affirmed in CLI 12-12,
8 reported in Volume 75 of NRC Issuances at page 603.

9 Thereafter, with the March 2013 and
10 February 2014 issuance of the NRC staff's draft and
11 final supplements to the Agency's generic
12 environmental impact statement on ISR mining
13 facilities relative to the Ross ISR facility, the
14 Board concluded that the focus of three of joint
15 intervenors' four admitted environmental contentions
16 that appropriately moved from the SEIER to the staff's
17 environmental documents so that these previously
18 admitted challenges to the SEIER became litigable
19 challenges to the staff's final supplemental
20 environmental impact statement, or SEIS. And thus are
21 the subject of the evidentiary hearing sessions we
22 will be conducting over the next several days.

23 To summarize, the issues under
24 consideration will be whether the NRC staff's final
25 SEIS fails to characterize adequately baseline or pre-

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1 mining groundwater quality and fails to establish that
2 groundwater samples were collected in a
3 scientifically-defensible manner; (2) failed to
4 analyze the environmental impacts if the applicant is
5 unable to restore groundwater or applicable
6 groundwater quality standards; and (3) inadequately
7 assesses the likelihood of impacts of fluid migration
8 to adjacent groundwater because of unplugged
9 exploratory bore holes and insufficient information
10 provided by SEI 6 monitor well clusters and 24-hour
11 pump tests at 4 of these clusters.

12 With us today as the parties to the
13 hearing are SEI, the NRC staff, and the joint
14 intervenors. Let's have the parties identify
15 themselves for the record, starting with SEI, then
16 moving to the staff, and finally to joint intervenors

17 MR. PUGSLEY: Your Honor, Christopher
18 Pugsley, counsel for SEI. I'm accompanied at
19 counsel's table by Anthony J. Thompson, counsel for
20 SEI; and Jack Fritz, WWC Engineering.

21 CHAIRMAN BOLLWERK: Thank you. Next, sir.
22 The NRC staff.

23 MR. HARPER: Your Honor, I am Richard
24 Harper, counsel for the NRC staff. With me here to my
25 left is Emily Monteith, counsel for the NRC staff; and

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1 to my right, Sabrina Allen, NRC staff paralegal.

2 CHAIRMAN BOLLWERK: All right, thank you.
3 And joint intervenors.

4 MR. FETTUS: Good morning, Your Honor. My
5 name is Geoffrey Fettus. I am a senior attorney for
6 the Natural Resources Defense Council and I'm joined
7 here at counsel table to my left is Shannon Anderson
8 of the Powder River Basin Resources Council. And to
9 my right joining me is Howard Crystal of the law firm
10 of Meyer Glitzenstein & Crystal.

11 CHAIRMAN BOLLWERK: Thank you. Also in
12 terms of an individual who might have been involved in
13 this proceeding, I would like to make a mention of Dr.
14 Kenneth Mossman. Dr. Mossman originally was one of
15 the Board members for this Licensing Board. He was
16 involved in the initial ruling on contention,
17 admissibility, and standing and Judge Mossman served
18 with the Board until about this time last year,
19 actually. He was appointed in the summer, the late
20 summer of 2013 by President Obama to the Defense
21 Nuclear Facilities Safety Board, part of DOE, that
22 oversees defense nuclear facilities and had actually
23 stepped aside and Judge White had taken his place on
24 the Board. About a month he actually was a professor
25 at Arizona State and about two months after he moved

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1 to Washington to become a Defense Nuclear Facilities
2 Safety Board member, he had a massive heart attack in
3 the Washington Metro and could not be revived. Judge
4 Mossman made great service to the Board and we do miss
5 him. I wanted to recognize Kenneth Mossman who was a
6 fine Licensing Board Panel member.

7 With regard to the three contentions being
8 litigated, as was outlined in the Board's July 25th
9 issuance regarding the administration of this
10 evidentiary hearing, the three contentions were
11 presented in the order that was outlined above,
12 basically, one, two, and three as I read them
13 previously.

14 Additionally, in our July 25th issuance,
15 we indicated that while the admitted contentions all
16 raise issues associated with the NRC staff's
17 supplement to the Agency's generic environmental
18 impact statement on ISR facilities, as the party with
19 the ultimate burden of proof under 10 CFR Section
20 2.325 relative to the issuance of the requested
21 license, SEI will present its witness and evidence for
22 Board questioning first, followed by the NRC staff and
23 then by joint intervenors.

24 Further, as we indicated in a September
25 25th issuance with respect to each contention, once we

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1 have heard individually from each of the parties'
2 witnesses regarding the contention, the Board may
3 recall all three parties' witnesses for that
4 contention for an additional round of Board questions
5 during which the Board may afford an opportunity for
6 each parties' witnesses to comment on the answers to
7 Board questions provided by other parties' witnesses.

8 Also, while the Agency's 10 CFR Part 2,
9 subpart L simplified hearing procedures governing this
10 proceeding contemplate that all questions for the
11 parties' witnesses will be posed by the Board. From
12 time to time we will pause to allow the parties to
13 propose and the Board to consider additional questions
14 for the Board to put to the witnesses. And I should
15 mention that since Judge Cole is coming in remotely,
16 obviously, we'll have to take a brief recess while we
17 talk with him about the questions that you propose.
18 So it may take a little more time than usual, but
19 hopefully we can be efficient at it, particularly
20 after once we get into the swing of things.

21 Finally, as part of our July 25th guidance
22 on the conduct of this evidentiary hearing, we
23 indicated we would afford counsel an opportunity to
24 make 15 minute opening statements. In that regard, in
25 a moment we'll turn first to counsel for SEI for its

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1 opening statement, followed by opening statements of
2 staff counsel and joint intervenors' counsel.

3 Before we do so, however, I want to make
4 mention of an aspect of this proceeding. As the Board
5 has noted in various issuances, including its December
6 8, 2011 initial pre-hearing conference scheduling
7 order and a July 25, 2014 notice regarding this
8 evidentiary hearing session which is published in the
9 Federal Register, Volume 79 at page 44,471, under
10 Section 2.315(a) of Title 10 of the Code of Federal
11 Regulations, presiding officers are authorized to
12 entertain limited appearance statements from members
13 of the public who are not otherwise parties to a
14 proceeding. These statements which are placed in the
15 official Agency docket of the proceeding are intended
16 as an opportunity for members of the public to express
17 their views about and may help the Board and/or the
18 parties in their consideration of the issues in the
19 proceeding.

20 As this juncture, the Board has received
21 several written limited appearance statements and
22 conducted a transcribed session in Sundance, Wyoming
23 this past Sunday afternoon at which members of the
24 public were afforded the opportunity to present their
25 views and concerns to the Board orally. If, however,

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1 there is anyone here who would like to provide the
2 Board with a written limited appearance statement,
3 there are forms available on the table just outside of
4 this room that you can complete and return to the
5 Board's law clerks, Kathleen Schroeder or Alana Wase
6 or its administrative assistant, Karen Valloch, before
7 this evidentiary proceeding adjourns. Or if you
8 prefer, you can submit a statement by mail or email by
9 following the instructions provided in the Federal
10 Register notice published in Volume 79 of the Federal
11 Register at page 44,472 and on the information flyer
12 that's also available on the table just outside the
13 hearing room.

14 In addition, I would observe that today we
15 will be utilizing some technology that will aid the
16 Board and the parties in conducting a more efficient
17 proceeding. One of the things we'll be doing during
18 this proceeding is marking the parties' exhibits
19 electronically rather than using an ink stamp or
20 labels as was customary in many judicial hearings.
21 This may involve some interchange between the Board
22 and our information technology technician, Joe
23 Deucher, who is sitting over there to my left.

24 Also, we anticipate using display
25 technology as part of the evidentiary presentations

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1 which hopefully will make the information we'll be
2 discussing with the parties' witnesses more accessible
3 and understandable to those in the audience today. As
4 I mentioned previously, Judge Cole will be
5 participating from the Licensing Board Panel's offices
6 in Maryland using videoconferencing and
7 teleconferencing technology.

8 Finally as we begin today's evidentiary
9 hearing, I would note that this is my cell phone, the
10 one that won't call NRC headquarters right now, which
11 I'm going to turn off and it's going to remain off for
12 the balance of this session. You won't work anyway,
13 I'll just turn you off. Okay.

14 I'd ask that all cell phones and similar
15 electronic devices in the hearing room be turned off
16 or placed on vibrate and that any cell phone
17 conversations be conducted outside of this room. That
18 will be the rule throughout this proceeding. Also, I
19 would note that as is the case in our Rockville,
20 Maryland hearing room, no food or beverages other than
21 water are to be consumed in this hearing room and I
22 very much appreciate folks following that guidance if
23 you would, please. I recognize there are soda
24 machines around the corner, but if you need to have a
25 soda, please have it outside this room. And I would

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1 very much appreciate that.

2 If none of the parties have anything for
3 the Board at this juncture, let's turn to SEI counsel
4 for their opening statement.

5 MR. FETTUS: Your Honor, this is Geoffrey
6 Fettus of the Natural Resources Defense Council. We
7 had one question that I'm sorry and I didn't get a
8 chance to discuss it with my colleagues at SEI or NRC
9 and this is not -- don't worry, this is no big
10 surprise. I just wanted to ask if the Board would
11 like and if it would make more sense to divide up the
12 15-minute introductions into 5 minutes before each
13 contention, then we might be able to do 5 minutes now
14 for the first contention which we're starting with,
15 that SEI starts with. And then five minutes for the
16 Contention 2 and then five minutes, so we don't get
17 lost, so we have an introduction for each day. It was
18 just a --

19 CHAIRMAN BOLLWERK: It's really up to
20 counsel. The Board, we don't have a preference, I
21 don't think.

22 MR. PUGSLEY: No objection from SEI.

23 MS. MONTEITH: No objection from the
24 staff.

25 CHAIRMAN BOLLWERK: Okay, then we'll go

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1 ahead and we'll do Contention 1 first and --

2 MR. HARPER: Thank you, Your Honor.

3 CHAIRMAN BOLLWERK: Given that, let me go
4 ahead and read Contention 1 and that will sort of be
5 an introduction of what we're going to do.

6 MR. HARPER: Your Honor, before we
7 proceed, if I may bring up an issue?

8 CHAIRMAN BOLLWERK: Sure.

9 MR. HARPER: This is Richard Harper from
10 the NRC staff. Staff counsel identified this morning
11 an error with one of our exhibits.

12 CHAIRMAN BOLLWERK: Okay.

13 MR. HARPER: Specifically Exhibit NRC016.
14 That exhibit and I'll read the title for you, the
15 exhibit is entitled ND Resources (1977), Nubeth Joint
16 Venture Environmental Report, Supportive Information
17 to Application for Source Material License, Sundance
18 Project.

19 In filing our exhibits, there were
20 actually two separate types of this document in the
21 Agency's ADAMS system and one was an excerpt of the
22 full document and the other one was a full document.
23 And the staff mistakenly filed the excerpt rather than
24 the full document. We have discussed this with staff
25 and our colleagues on SEI and the intervenors' counsel

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1 and explained the situation to them. We have refiled
2 that exhibit as NRC016R in its entirety. We've
3 corrected the ML number and we have -- we are in the
4 process of making paper copies to distribute for the
5 convenience of the Board and the other parties.

6 CHAIRMAN BOLLWERK: Okay. So it's a staff
7 exhibit it deals with -- given the number, I'm
8 assuming it deals with Contention 1?

9 MR. HARPER: It does.

10 CHAIRMAN BOLLWERK: And you have already
11 refiled it with the e-filing system?

12 MR. HARPER: We have.

13 CHAIRMAN BOLLWERK: Okay. So assuming you
14 can give us the paper copies, I think everything
15 should be good and we'll go ahead and maybe it's
16 possible that one of the law clerks could check to see
17 if it's come through the e-filing system at some
18 point, if you can do that or not. I don't know if
19 your computers allow that or not given the way we've
20 got everything tied up. In any event, we'll try to
21 check that. And if that's the case, then we can go
22 ahead and just admit that revised -- you gave it an R
23 number I take it?

24 MR. HARPER: We did.

25 CHAIRMAN BOLLWERK: Okay, then we'll just

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1 admit the revised version when we get to that
2 document.

3 MR. HARPER: Thank you.

4 CHAIRMAN BOLLWERK: Okay.

5 MR. PUGSLEY: Your Honor?

6 CHAIRMAN BOLLWERK: Yes.

7 MR. PUGSLEY: Chris Pugsley for SEI. We
8 have conferred with all counsel about asking the Board
9 what the procedure and timing will be of dealing with
10 admission of the exhibits to the record. I know you
11 had spoken about it in your opening remarks, but we
12 were just wondering what your procedure would be and
13 was wondering if we might offer a suggestion.

14 CHAIRMAN BOLLWERK: Okay, I'll tell you
15 what my procedure will be and then you can offer your
16 suggestion and then I'll tell you what my procedure
17 will be.

18 MR. PUGSLEY: Yes, sir.

19 CHAIRMAN BOLLWERK: So you need to
20 understand, I come from the background with the Appeal
21 Panel, a number of years ago. I was an Appellate
22 Judge for several years, the happiest two years of my
23 life. And I became very attuned to the fact that if
24 judicial records coming up from the Licensing Board
25 are not done properly, it can be a big problem for the

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1 appeal folks. So my intent here was to do contention
2 by contention, basically party by party, take that
3 party's exhibits and to identify them and admit the
4 exhibits that relate to that contention.

5 Having said that, obviously, some of these
6 contentions -- I'm sorry some of the exhibits relate
7 to multiple contentions. That's fine. We'll admit
8 the exhibit once. We're not going to go through
9 several times. So in theory, the number of admissible
10 contentions will get shorter as we get along. So that
11 would be what I would intend to do. What would you
12 prefer to do?

13 MR. PUGSLEY: I think that's just fine,
14 Your Honor.

15 CHAIRMAN BOLLWERK: I'm not going to try
16 to -- I don't want to make this, in fact -- in the
17 past I've had counsel actually identify the documents
18 as we go through each one. I'm going to do that very
19 briefly. I don't want to put that burden on you
20 because I know that's one of the things you don't like
21 to do, but I think it's important to get at least an
22 identification of each document as we put it into the
23 record.

24 I know that probably the process now that
25 many of the Judges are using is to admit things en

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1 masse. I found that sometimes that works and
2 sometimes it doesn't. And if we could just do each
3 one, get it in, and then we don't have to worry about
4 it any more. And hopefully we'll all walk away with
5 a happy record and that's the bottom line. But if you
6 have something else, I'd be glad to listen. But I
7 think this will work.

8 MR. PUGSLEY: I completely understand.
9 Thank you, sir.

10 CHAIRMAN BOLLWERK: And the first thing
11 we'll do with each witness panel obviously is admit
12 their testimony. That will be the first thing. And
13 we're not using the former practice or the old
14 practice of putting it into the transcript. We'll
15 basically admit them as exhibits. But I may go ahead,
16 after I swear in the witnesses, have them affirm their
17 testimony like we used to do when we did -- when we
18 put it in the transcript. It's always good to have
19 them make sure that they tell us yes, indeed, they
20 were the ones who wrote this or supervised the
21 writing of it. Does that answer your question?

22 MR. PUGSLEY: Yes, sir. Thank you.

23 CHAIRMAN BOLLWERK: Anything else
24 preliminary that we need to talk about? Okay, since
25 we're going to do this contention by contention, this

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1 is a good introduction. Let me just read the
2 contention because it's always a good idea, we're
3 supposed to be litigating.

4 So the first contention which is
5 Environmental Contention 1, the title is the FSEIS
6 fails to adequately characterize baseline (i.e.,
7 original or pre-mining) groundwater quality. And the
8 contention states that the FSEIS fails to comply with
9 10 CFR Sections 51.90 to 94; 10 CFR Part 40, Appendix
10 A; and NEPA, because it lacks adequate description of
11 the present baseline, i.e., the original or pre-mining
12 groundwater quality and fails to demonstrate that
13 groundwater samples were collected in a
14 scientifically-defensible manner using proper sampling
15 methodologies. The FSEIS's departure from NRC
16 guidance serves as additional evidence of these
17 regulatory violations, NRC NUREG 1569 Standard Review
18 Plan for in situ uranium extraction license
19 applications Section 2.7.1, 2.7.3, 2.7.4, 2003. And
20 that last thing I read is a citation to NUREG 1569 and
21 specific sections to it that support the contention.

22 All right, and so if SEI would like to
23 start and I guess we're going to do five minutes each
24 on introduction to Contention 1.

25 MR. PUGSLEY: Good morning, Your Honor,

1 members of the Board, may it please the Court. My
2 name is Christopher Pugsley and along with my co-
3 counsel, Anthony Thompson, we are here on behalf of
4 Strata Energy, Incorporated, or SEI, in support of its
5 Ross ISR project NRC license.

6 As a general matter, Strata respectfully
7 submits to the Board that its license application
8 including its technical report and environmental
9 report, subsequent responses to requests for
10 additional information, and NRC's Draft and Final SEIS
11 Safety Evaluation Report and the remainder of the
12 record of decision adequately satisfy NRC regulations
13 for 10 CFR Part 51 NEPA reviews.

14 Each of the three admitted contentions in
15 this proceeding, including Contention 1, is classified
16 as an environmental contention and implicate these
17 environmental reviews as noted previously by the
18 staff, including the information supplied by Strata.

19 Since none of the admitted contentions has
20 been admitted as a safety contention, the intervenors'
21 allegations do not constitute challenges to the Safety
22 Evaluation Report and any other safety findings
23 regarding the adequate protection of public health and
24 safety and the environment either in the SER or
25 incorporated into and as applied in the FSEIS and the

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1 remainder of the ROD.

2 Despite this, Strata asserts its license
3 application ROD go above and beyond the acceptance
4 criteria denoted in NUREG 1569 guidance for ISR
5 applications.

6 While NUREG 1569 may be characterized by
7 some as technical guidance, Strata has noted in its
8 initial statement of position that Table 1 of this
9 document, specifically identifies resource areas which
10 are encompassed in the admitted contentions that
11 relate directly to NRC staff's environmental review
12 and that should be taken into account from this
13 proceeding.

14 Strata has engaged in a policy of early
15 and often interaction with NRC staff, including
16 multiple pre-license application submission meetings,
17 a pre-submission audit meeting with staff and members
18 of the public present for review, all of which again
19 were open to public participation.

20 Moving to Contention 1 specifically,
21 Strata's approach site characterization of groundwater
22 at the Ross ISR project is consistent with NRC
23 regulations at 10 CFR Part 40 and Appendix A criteria
24 as they implement the Atomic Energy Act of 1954 as
25 amended by the Uranium Mill Tailings Radiation Control

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1 Act of 1978 and NRC staff's guidance at NUREG 1569
2 which represents its expert interpretation of the
3 Commission's regulations as delegated under 10 CFR
4 Part 1.41(b)(18) and (19) and which is to be accorded
5 special weight and deference under Commission
6 precedent as stated in the Yankee Atomic case, CLI 05-
7 15. License applicants follow this guidance as it
8 defines what is expected of a license applicant when
9 applying for an ISR license.

10 The scope of NRC staff's need to review
11 from a legal perspective is thoroughly discussed in
12 Strata's initial statement of position and
13 demonstrates that joint intervenors' consistent claims
14 that more data is needed are refuted by Commission
15 precedent, stating that agencies must be accorded the
16 discretion to determine how much data is required for
17 an initial licensing decision.

18 With respect to specific technical and
19 environmental arguments, Strata submits that
20 intervenors' claims are without merit and Strata will
21 be relying on the expert testimony for Contention 1 of
22 Mr. Ralph Knode, Mr. Hal Demuth, Mr. Errol Lawrence,
23 and Mr. Ben Schiffer.

24 With respect to Contention 1, Strata's
25 approved license application in the final record of

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1 decision contained a required baseline groundwater
2 quality data consistent with NRC regulations at 10 CFR
3 Part 40 Appendix A Criterion 7 and guidance at NUREG
4 1569, Chapter 2 for site characterization. A
5 fundamental legal question that sets the stage for
6 Contention 1 is how the Commission's ISR regulatory
7 program addresses two stages of groundwater quality
8 characterization data and analyses, one from Appendix
9 A Criterion 7 regarding "baseline" groundwater quality
10 for an initial licensing decision and Criterion
11 5(b)(5) Commission-approved background for post-
12 license issuance pre-operational water quality. This
13 approach is consistent with the multi-faceted and on-
14 going regulatory process that is sufficiently detailed
15 and prescriptive assuming Strata compliance that the
16 necessary "reasonable assurance" of protection of
17 public health and safety is provided per Commission
18 precedent in the Hydro Resources case at CLI-06-01.

19 Criterion 7 baseline groundwater quality
20 as described in NUREG 1569, Chapter 2, is all that is
21 required for an initial licensing decision from NRC,
22 such as a grant of the Ross license. As discussed in
23 Strata's initial position statement, NUREG 1569 states
24 that review of the license application is "not based
25 on comprehensive information." SEI 007 at 36.

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1 For Criterion 5, Commission approved
2 background, a license applicant submits procedures for
3 how additional post-license issuance of groundwater
4 quality data is gathered. With that said, Strata's
5 license application in the final ROD provide enough
6 data and analysis to satisfy the hard look requirement
7 under NEPA. And as shown in Table 1 of NUREG 1569, as
8 I said before, it applies. These resource areas are
9 evaluated for an environmental review as well as a
10 safety review.

11 As is standard in the licensing process,
12 license conditions are imposed to require additional
13 groundwater data to support Commission-approved
14 background and these are in Strata's license, SEI 015,
15 Conditions 10.13 and 11.3. And as stated above, this
16 approach is specifically endorsed by Commission
17 precedent in CLI-0601 which concurred the Licensing
18 Board determination at post-license gathering of site-
19 specific groundwater data to determine Commission-
20 approved background is consistent with NRC regulations
21 and performance-based licensing and sequential
22 wellfield development of ISR projects.

23 As will be noted by our experts in their
24 testimony, Strata not only complied with regulations,
25 but went above and beyond those regulations in order

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1 to demonstrate satisfaction of Criterion 7 baseline
2 water quality data. Regarding potential impacts
3 levied by the intervenors of impacts to the baseline
4 water quality from well or bore hole drilling,
5 Strata's expert, Mr. Knode's testimony shows that well
6 drilling and development techniques used at the Ross
7 site do not, in fact, result in the impacts alleged by
8 the intervenors.

9 The intervenors also claim that past
10 Nubeth operations have impacted current water quality.
11 However, restoration was approved by both Wyoming
12 Department of Environmental Quality and NRC for this
13 project and the license was ultimately terminated by
14 the NRC. Further, Strata's Exhibit SEI 019 also shows
15 that Nubeth R&D site and current industrial wells in
16 potentiometric surface demonstrates that groundwater
17 is moving toward the historic Nubeth monitor wells and
18 industrial wells.

19 With that said, and submitting to the
20 Board our expert witness testimony for Panel 1, Strata
21 respectfully requests that the Board find that
22 Contention 1 does not merit a modification of NRC's
23 record of decision including the final supplemental
24 environmental impact statement. Thank you.

25 CHAIRMAN BOLLWERK: Thank you, sir. All

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1 right, turn to the staff then.

2 MS. MONTEITH: Good morning, Your Honors.
3 Emily Monteith for the NRC staff.

4 First, I'd like to say that the staff
5 looks forward to answering the Board's questions
6 during this oral portion of the evidentiary hearing.
7 The staff is confident that it can provide the Board
8 and also the public attending the hearing with
9 information showing how carefully the staff considered
10 the environmental issues raised by the admitted
11 contentions.

12 As the staff explained in its testimony,
13 and as it hopes to explain further over the course of
14 the next few days, the staff thoroughly considered the
15 baseline quality of groundwater at the Ross project
16 area.

17 The staff's witnesses for Contention 1 are
18 John Saxton, Johari Moore, and Kathryn Johnson. All
19 of the staff's witnesses have extensive experience in
20 their fields. Mr. Saxton is a hydrogeologist and a
21 safety project manager for the Ross project license
22 application. He has more than 28 years of experience
23 in both the private and public sectors specializing in
24 the field of hydrogeology and environmental
25 investigations.

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1 Ms. Moore is the environmental project
2 manager for the Ross project license application. She
3 has nine years of professional experience preparing
4 environmental reviews related to the licensing of
5 uranium recovery, fuel cycle, and irradiator
6 facilities.

7 Finally, Dr. Johnson is a geochemist with
8 over 30 years of experience in the geochemistry of
9 uranium and associated metals. She served as a
10 subject matter expert for the FSEIS on matters related
11 to water quality and she was the principal editor of
12 all sections related to geology, soils, and
13 hydrogeology.

14 As the staff has explained in its written
15 testimony, the staff's findings and conclusions in the
16 FSEIS are drawn from the extensive information it
17 considered during its review. This includes
18 information submitted by Strata with its application
19 and response to request for additional information.

20 In Contention 1, the joint intervenors
21 argue that Strata must provide and the staff must
22 analyze more information relating to the
23 characterization of baseline groundwater for the Ross
24 project. For this proposition, intervenors cite
25 Criteria 7 and 5(b)(5) of 10 CFR Part 40, Appendix A.

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1 As the staff explained in its written
2 testimony, Strata did provide and the staff did
3 analyze complete baseline groundwater quality
4 information. Pursuant to Criterion 7 and more
5 applicably, NUREG 1569, the Standard Review Plan for
6 in situ leach uranium extraction license application.

7 The Standard Review Plan is the NRC's
8 guidance for determining whether an applicant has
9 provided the safety and environmental information
10 necessary for the staff to determine whether to issue
11 a license. The staff found that the baseline
12 information provided by Strata met the acceptance
13 criteria in the Standard Review Plan. This data
14 formed the basis for the staff's discussion of
15 baseline groundwater conditions at the Ross site in
16 the FSEIS. The discussion of this information is
17 found principally in Section 3.5.3.3 of the FSEIS such
18 as Exhibit SEI009A.

19 Moreover, Strata will also be required as
20 a condition of its license to establish the Commission
21 -approved background concentrations in groundwater
22 constituents prior to commencing operations at the
23 Ross site. This requirement is included as Condition
24 11.3 of Strata's license and is described in the
25 staff's SEIS. This approach is consistent with the

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1 Standard Review Plan which acknowledges that it's
2 appropriate for an applicant to submit certain
3 background water quality information used for
4 excursion monitoring and restoration after it receives
5 its license.

6 I'll note that while the Standard Review
7 Plan is not in itself binding on the Board, the
8 Commission has stated that staff guidance is
9 implicitly endorsed by the Commission and therefore is
10 entitled the corresponding special weight. The
11 citation for that statement is Yankee Atomic Electric
12 Company, CLI-0529.

13 In addition, in Hydro Resources, that's
14 CLI-0601, the Commission found that the staff may use
15 license conditions to require licensee to submit
16 additional information on water quality after it
17 receives a license. As the Commission explained in
18 that decision, the site-specific data to confirm
19 proper baseline quality values cannot be collected
20 until an in situ leach wellfield has been installed.

21 Finally, the intervenors also raise
22 several additional claims regarding the methodology
23 used to develop the baseline groundwater data that
24 Strata did provide and the methodology and techniques
25 they believe should be used to develop further

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1 baseline groundwater data.

2 The staff addressed these various claims
3 in its written testimony and looks forward to
4 addressing these issues further today. Thank you.

5 CHAIRMAN BOLLWERK: Thank you. Just one
6 reminder, that these mics are very directional, so
7 make sure you have them down near your mouth. If
8 you're too far away, not only will the court reporter
9 have a hard time hearing you potentially, but Judge
10 Cole as well, and he's a long way away. We want to
11 make sure he hears. And the same thing would apply to
12 the witnesses and we'll try to remind them as well.
13 Thank you.

14 So the joint intervenors then?

15 MS. ANDERSON: Thank you, Your Honor,
16 members of the Board. Shannon Anderson on behalf of
17 the joint intervenors. First off, the joint
18 intervenors want to welcome you to Wyoming. As you
19 most likely noted on your site visit on Saturday, the
20 Cowboy State is no stranger to energy development.
21 However, in order to maintain the state's high quality
22 of life and protect important natural resources, such
23 as critical groundwater supplies, Wyomingites rely on
24 agencies to take a hard look at the impacts of energy
25 development and their work to prevent and mitigate

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1 those impacts through their decision-making processes.
2 And that is exactly what NEPA requires.

3 The law requires agencies like the NRC to
4 carefully consider the foreseeable impacts of uranium
5 projects before they take action. Unfortunately, as
6 joint intervenors have explained in our briefs, and
7 through the testimony of expert witnesses, in this
8 case, NRC has not adequately considered some of the
9 most important aspects of the project. Contention 1
10 is a prime example of the NRC's flaws in its NEPA
11 analysis. Contention 1 centers on whether the NRC
12 included enough data and analysis in its EIS to
13 sufficiently characterize groundwater quality in the
14 project area. Characterization of groundwater quality
15 is necessary to assess pre-ISL project conditions, and
16 in turn, to be able to analyze post-project impacts.

17 As Dr. Abitz explains, this analysis is a
18 critical part of considering the impacts of an ISL
19 project. Dr. Abitz' testimony shows that the data
20 disclosed in the EIS cannot establish in a
21 scientifically-defensible manner baseline water
22 quality. And in fact, neither Strata nor NRC claimed
23 that the information in the EIS is enough to
24 sufficiently determine pre-project background water
25 quality as required by Criterion 5(b)(5).

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1 As discussed in the party's statements,
2 NRC will rely heavily on a wellfield package that has
3 yet to be submitted to determine water quality
4 parameters for restoration targets and excursion
5 prevention. However, as joint intervenors have
6 argued, NEPA requires agencies to consider data like
7 that before decisions are made, not after the facts.

8 To be clear, joint intervenors are not
9 arguing that the full wellfield package of 100 plus
10 wells is necessary to establish baseline conditions
11 for NEPA purposes. However, as Dr. Abitz explains,
12 NRC needs to do something more than they did in the
13 EIS. And importantly, in order to fulfill NEPA's twin
14 purposes, this data must be collected and analyzed as
15 part of the Agency's decision-making process and
16 subject to public review and comment.

17 As further support of the need to collect
18 this data now, Dr. Abitz' testimony explains why a
19 post-decision collection, a baseline data could likely
20 bias the results. Thus, from both the legal and a
21 technical standpoint, additional baseline water
22 quality data was needed for NRC's decision-making
23 process.

24 As you just heard, NRC and Strata claim
25 that the EIS contains a description of baseline water

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1 quality sufficient to characterize pre-project
2 conditions. Dr. Abitz has thoroughly rebuked this
3 claim with testimony that shows that NRC's EIS does
4 not include a scientifically rigorous data collection
5 effort that used appropriate methodology to disclose
6 and consider baseline water quality values. Dr.
7 Abitz' testimony is based on his many years of
8 experience working on a variety of different projects.
9 Dr. Abitz is very familiar with the level of data
10 necessary to establish statistically sound baseline
11 conditions and explains a number of reasons why NRC's
12 analysis in the EIS falls short of meeting that
13 standard.

14 While Strata and NRC claim that the EIS
15 merely needs to include a qualitative assessment of
16 the affected environment, Dr. Abitz shows that a
17 scientifically defensible quantitative analysis of
18 baseline water quality data is exactly what is needed
19 in this case. When it is critical in considering the
20 information the Agency needs, and it's a decision-
21 making process like it is here, NEPA requires
22 scientifically defensible quantitative analyses.

23 For all of these reasons, NRC's EIS falls
24 short of NEPA's requirements by failing to adequately
25 consider the important aspect of Strata's ISL project,

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1 baseline or background water quality in and around the
2 project area. Thank you for your time and
3 consideration.

4 CHAIRMAN BOLLWERK: Thank you very much.
5 All right, at this point, Judge White is there
6 anything you want to say before we begin? No.

7 Judge Cole, are you still with us?

8 JUDGE COLE: Still with you.

9 CHAIRMAN BOLLWERK: All right. Let's go
10 ahead and start with SEI's witnesses for Contention 1
11 and I believe there are four of them.

12 MR. PUGSLEY: That's correct, sir.

13 CHAIRMAN BOLLWERK: Mr. Knode, am I
14 pronouncing that right?

15 MR. PUGSLEY: Yes.

16 CHAIRMAN BOLLWERK: Mr. Demuth?

17 MR. PUGSLEY: Mr. Demuth.

18 CHAIRMAN BOLLWERK: Demuth, excuse me.
19 Mr. Demuth. Mr. Lawrence, that one I got. Mr.
20 Schiffer.

21 MR. PUGSLEY: That's correct, sir.

22 CHAIRMAN BOLLWERK: If you all gentleman
23 can come up and go ahead and sit at the first table
24 and sort of put yourselves in the middle. That will
25 give the court reporter the best view of what's going

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1 on so we make sure we get an accurate transcript. And
2 hopefully, you're close enough to one of the monitors
3 you can see if you need to although you may be able to
4 see what's going on up there as well, if that's
5 necessary.

6 All right. Let's go ahead and swear you
7 gentlemen in. If you could raise your right hand.
8 And I will ask you for an individual oral response to
9 the following question. We'll start at this end of
10 the table. Do you swear or affirm that the testimony
11 you will give in this proceeding will be the truth,
12 the whole truth, and nothing but the truth?

13 MR. KNODE: I do.

14 MR. LAWRENCE: I do.

15 MR. DEMUTH: I do.

16 MR. SCHIFFER: I do.

17 CHAIRMAN BOLLWERK: Let's go ahead and
18 adjust the mics so you can get it right. It really
19 works best when it's pretty close to you because these
20 are very directional mics.

21 And so we then have three pieces, I'm
22 sorry, four pieces -- hold on one second, let me get
23 the right page. Three pieces of direct testimony,
24 SEI001, SEI006, SEI026, and SEI005 and that's four
25 pieces, I'm sorry. And then three pieces of a

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1 rebuttal testimony, SEI047, SEI046 for both Mr. Demuth
2 -- I mispronounced it again.

3 MR. DEMUTH: Demuth, Your Honor.

4 CHAIRMAN BOLLWERK: Demuth, Demuth. I'm
5 going to get it in a second. Demuth. And Mr.
6 Lawrence. And then SEI045 for Mr. Schiffer. So four
7 pieces of direct testimony, three pieces of rebuttal
8 testimony.

9 So first of all, let me ask all four of
10 you and again, I need an individual response from each
11 of you. The testimony that I just described, was this
12 testimony prepared by you or under your supervision
13 and direction and is it true and correct to the best
14 of your knowledge and belief? And we'll start again
15 on this end.

16 MR. KNODE: Yes, it is, Your Honor.

17 MR. LAWRENCE: Yes, it is, Your Honor.

18 MR. DEMUTH: Yes, it is, Your Honor.

19 MR. SCHIFFER: Yes, it is, Your Honor.

20 CHAIRMAN BOLLWERK: All right. Then let's
21 go ahead and we're going to identify, we're going to
22 go ahead and identify the testimony for the record, as
23 well as the exhibits that accompany each one of these
24 pieces of testimony. It will take us a second. And
25 then we'll move it into evidence and then we'll come

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1 back to you all and we'll start with a round of
2 questions.

3 So now is a good time get a drink of water
4 and relax because in a second, Judge White is going to
5 have a few questions, I think, to start off.

6 Okay, so what we'll do now is do the SEI
7 exhibits that relate to these four witnesses. I'm
8 going to describe them very briefly for the record,
9 identify them, and then we'll admit them into
10 evidence. I will ask for objections after I've
11 identified them. Having said that, no one really --
12 with one exception, lodge any objections I would be
13 surprised to hear any now, but there is one final
14 opportunity if you have a concern, although again, we
15 did say that unless you've got something really good,
16 these are late, ladies and gentlemen, because that was
17 sort of the process that we set out.

18 Let's start out with SEI001 which is Mr.
19 Knode's initial written testimony.

20 SEI002 which is his curriculum vitae.

21 SEI003 which is a diagram depicting air-
22 lift development of ISR wells.

23 SEI004A which is an NRC July 10, 2009
24 memorandum.

25 SEI004B which is an NRC July 10, 2009

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1 memorandum and supporting data. Some of these
2 exhibits only go to Contention 1. Some go to all of
3 the Contentions.

4 SEI005, Ben Schiffer's initial written
5 testimony. And if you hear me saying anything wrong,
6 let me know, all right?

7 SEI006 which is Mr. Schiffer's CV.

8 SEI007 which is NUREG 1569 Standard Review
9 Plan for In Situ Leach Uranium License Applications.

10 SEI008 which is Reg. Guide 4.14,
11 Radiological Effluent and Environmental Monitoring at
12 Uranium Mills.

13 SEI009A and SEI009B which are the SEIS
14 Volume 1, cover through Appendix B and then Volume 2,
15 Appendix C to the end.

16 SEI010 which is the Safety Evaluation
17 Report for the Strata Energy, Incorporated ISR
18 Project.

19 SEI011, the Wyoming Department of
20 Environmental Quality LQD Non-Coal Chapter 11
21 Institute of Mining.

22 SEI012A which again is the Wyoming
23 Department of Environmental LQD Guideline 4 Institute
24 of Mining, March 2000.

25 SEI012B which is the Wyoming Department of

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1 Environmental Quality LQD Guideline 4 Institute of
2 Mining for October 28, 2013.

3 SEI013 which again Wyoming Department of
4 Environmental Quality, LQD Guideline 8, Hydrology.

5 SEI014A, B, C, D, E, F, G, H, I, J, K, M,
6 N, O and P, all those again SEI014. Those are all the
7 parts of the Ross Technical Report starting with
8 Volume 1a and going through Volume 6e, Addendum 4.2b
9 through 6.4a. And did I get all of them, did I
10 mention them?

11 MR. PUGSLEY: Yes, sir.

12 CHAIRMAN BOLLWERK: SEI015 which is the
13 NRC License SUA-1601 which is the license for the
14 Strata facility, the Ross facility, I believe.

15 SEI016A and B and C and D and E, which are
16 the Ross ER Volume 1. Starts with a Cover through
17 Section 3.5 and SEI016E is the Ross ER Volume 3
18 Addenda 3.5A through 4.6A, basically the Ross
19 Environmental Report Volumes 1, 2, and 3.

20

21 SEI017 which is the Ross ER RAI Responses.

22 SEI018 which is a Comparison between the
23 Regulatory Guidelines and Parameters Analyzed by
24 Strata.

25 SEI019 which is the Ross Ore Zone

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1 Potentiometric Surface and Regional Monitor Well
2 Location Map.

3 SEI020A, B, D, E, F, G which are the --
4 starts with the Preliminary Baseline Sampling Plan for
5 the Ross In Situ Recovery Project and includes B,
6 being Appendix C. C being Exhibit 1. D being Exhibit
7 2. Exhibit 3 is E. Exhibit 4 is F. And Exhibit 5 is
8 G.

9 SEI021 this is the Wyoming Department of
10 Environmental Quality Correspondence on the
11 Preliminary Baseline Sampling Plan for the Ross ISR
12 Uranium Recovery Project.

13 SEI022, the October 29, 2009 NRC Public
14 Meeting Summary.

15 SEI023, February 17, 2010, NRC Public
16 Meeting Summary. SEI024, the April 13, 2013 NRC
17 Public Meeting Summary.

18 SEI014, the Baseline Groundwater
19 Characterization Comparison to Other Licensed ISR
20 Facilities in Wyoming.

21 SEI026, Hal -- I did it again. Can you
22 pronounce your name for me?

23 MR. DEMUTH: Demuth.

24 CHAIRMAN BOLLWERK: Demuth. Hal Demuth
25 and Errol Lawrence Initial Written Testimony.

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1 SEI027, Hal Demuth, Curriculum Vitae.
2 SEI028, Errol Lawrence, Curriculum Vitae.
3 SEI029, Figure to Accompany Hal Demuth and
4 Errol Lawrence Initial Written Testimony.
5 SEI030, United States Geologic Survey,
6 Water Supply Paper 2220, Basic Ground-Water Hydrology,
7 1983.
8 SEI031, the National Mining Association's
9 Generic Environmental Report in Support of the NRC's
10 Generic Environmental Impact Statement for In Situ
11 Uranium Recovery Facilities.
12 SEI032, a Typical ISR Process Diagram.
13 SEI033, the Pre-Licensing Well
14 Construction, Lost Creek ISR Uranium Recovery Project.
15 SEI034, the EPA Aquifer Exemption
16 Approval.
17 Then we're going to skip to SEI045. That
18 would be the next one I have, is that correct?
19 MR. PUGSLEY: Yes, sir.
20 CHAIRMAN BOLLWERK: Contention 1. Ben
21 Schiffer Rebuttal Testimony.
22 SEI0146, Hal Demuth and Errol Lawrence
23 Rebuttal Testimony.
24 SEI047, Ralph Knode Rebuttal Testimony.
25 SEI050, FEIS for the Powder River Basin

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1 Oil and Gas Project, Chapter 3.

2 SEI051, FEIS for the West Antelope II Coal
3 Lease, Volume 1.

4 SEI052, FEIS for the Eagle Butte West Coal
5 Lease.

6 SEI053, FEIS for the Maysdorf Coal Lease.

7 And I believe that is it. Did I get everything for
8 Contention 1?

9 MR. PUGSLEY: Yes, Your Honor. You did.

10 CHAIRMAN BOLLWERK: All right. So I've
11 just identified for the record those exhibits. They
12 are identified for the record.

13 (Whereupon, the above-referred to
14 documents were marked as SEI001, SEI002,
15 SEI003, SEI004A and SEI004B, SEI005,
16 SEI006, SEI007, SEI008, SEI009A, SEI009B,
17 SEI010, SEI011, SEI012A, SEI012B, SEI013,
18 SEI014A, SEI014B, SEI014C, SEI014D,
19 SEI014E, SEI014F, SEI014G, SEI014H,
20 SEI014I, SEI014J, SEI014K, SEI014L,
21 SEI014M, SEI014N, SEI014O, SEI014P,
22 SEI015, SEI016A, SEI016B, SEI016C,
23 SEI016D, SEI016E, SEI017, SEI018, SEI019,
24 SEI020A, SEI020B, SEI020C, SEI020D,
25 SEI020E, SEI020F, SEI020G, SEI021,

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1 SEI022, SEI023, SEI024, SEI025, SEI026,
2 SEI027, SEI028, SEI029, SEI030, SEI031,
3 SEI032, SEI033, SEI034, and SEI045,
4 SEI046, SEI047, SEI050, SEI051, SEI052
5 and SEI053 for identification.)

6 And then we're going to admit them into
7 evidence. Anyone have any objections?

8 If not, then SEI001, SEI002, SEI003,
9 SEI004A and SEI004B, SEI005, SEI006, SEI007, SEI008,
10 SEI009A, SEI009B, SEI010, SEI011, SEI012A, SEI012B,
11 SEI013, SEI014A, SEI014B, SEI014C, SEI014D, SEI014E,
12 SEI014F, SEI014G, SEI014H, SEI014I, SEI014J, SEI014K,
13 SEI014L, SEI014M, SEI014N, SEI014O, SEI014P, SEI015,
14 SEI016A, SEI016B, SEI016C, SEI016D, SEI016E, SEI017,
15 SEI018, SEI019, SEI020A, SEI020B, SEI020C, SEI020D,
16 SEI020E, SEI020F, SEI020G, SEI021, SEI022, SEI023,
17 SEI024, SEI025, SEI026, SEI027, SEI028, SEI029,
18 SEI030, SEI031, SEI032, SEI033, SEI034, and SEI045,
19 SEI046, SEI047, SEI050, SEI051, SEI052 and SEI053 are
20 all received into evidence.

21 (Whereupon, the above-referred to
22 documents were received into evidence as
23 SEI001, SEI002, SEI003, SEI004A and
24 SEI004B, SEI005, SEI006, SEI007, SEI008,
25 SEI009A, SEI009B, SEI010, SEI011,

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1 SEI012A, SEI012B, SEI013, SEI014A,
2 SEI014B, SEI014C, SEI014D, SEI014E,
3 SEI014F, SEI014G, SEI014H, SEI014I,
4 SEI014J, SEI014K, SEI014L, SEI014M,
5 SEI014N, SEI014O, SEI014P, SEI015,
6 SEI016A, SEI016B, SEI016C, SEI016D,
7 SEI016E, SEI017, SEI018, SEI019, SEI020A,
8 SEI020B, SEI020C, SEI020D, SEI020E,
9 SEI020F, SEI020G, SEI021, SEI022, SEI023,
10 SEI024, SEI025, SEI026, SEI027, SEI028,
11 SEI029, SEI030, SEI031, SEI032, SEI033,
12 SEI034, and SEI045, SEI046, SEI047,
13 SEI050, SEI051, SEI052 and SEI053.)

14 That will all be reflected in the record.
15 Any questions? That's probably the worst one,
16 hopefully.

17 All right, if there's nothing further --
18 anything from you Judge Cole at this point?

19 JUDGE COLE: No, not now.

20 CHAIRMAN BOLLWERK: Are you still awake?
21 I'm sorry, I didn't mean to do that to you. Okay,
22 let's go ahead and start with Judge White. He has
23 some questions for the panel.

24 JUDGE WHITE: Yes, I'd like to start by
25 defining some terms and getting some basic concepts

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1 straight that we will be discussing with regards to
2 this contention, as well as discussing with regards to
3 future contentions. I understand all of this
4 information is readily available in written testimony,
5 so I hope you'll bear with you and get a few of these
6 things so we all know what we're talking about when we
7 use these terms.

8 One place to look is in the NRC license
9 and on page 12, Section 11.3 it states "prior to
10 injection of lixiviant in a wellfield, the licensee
11 shall establish background water quality data for the
12 ore zone, overlying and underlying aquifers. The
13 background water quality sampling shall provide
14 representative baseline data and establish groundwater
15 protection standards and excursion monitoring upper
16 control limits as describe in Section 5.7.8 of the
17 improved license application in this license
18 condition."

19 So we have three terms right in this
20 paragraph, background water quality, baseline data,
21 and excursion monitoring upper control limits.

22 Elsewhere, I believe on that page, we come
23 across the term Commission-approved background.
24 That's abbreviated CAB and the excursion monitoring
25 upper control limits is abbreviated throughout many

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1 documents UCL.

2 Can we get your idea of a brief definition
3 of those four terms, background water quality,
4 baseline data, excursion monitoring upper control
5 limits, and Commission-approved background as they
6 apply to the issues at hand?

7 MR. SCHIFFER: Judge, this is Ben
8 Schiffer. And just as a background, I was responsible
9 for the licensing of this project from basically 2005
10 to April 2014. And so I guess as a start in terms of
11 the background water quality that's described in this
12 license condition I think it's important to understand
13 that the monitoring well infrastructure that would be
14 required for that is something that is intense and a
15 high density of wells would be installed. And I
16 believe the best license condition talked to that in
17 particular for the ore zone and the density which
18 actually exceeds the density recommended in the SRP.

19 So in order to develop that, the wells are
20 installed first in the ore zone interval at a density
21 of one well per two acres. And then in the overlying
22 and underlying at a density of one well per four
23 acres, as well as surrounding the wellfield area. And
24 that is at a distance of 400 feet from the area of the
25 mining and at an offset of one another of 400 feet.

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1 So those wells are installed. They are developed per
2 the procedures that Strata has in place and the
3 sampling of those wells begins. And that sampling is
4 four samples with at least two weeks between them for
5 a parameter suite that is defined in the license
6 application. And I think in my testimony you'll find
7 that that parameter suite is consistent with or in
8 some cases in excess of what other licensees have for
9 the parameter suite.

10 Along with that, there are quality
11 assurance and quality control samples that are a
12 matter of program for Strata to collect. For us, we
13 collected at least, and I believe this will be
14 consistent in the future at least, of one additional
15 sample for every ten samples as a quality control and
16 quality assurance and I think in my testimony, initial
17 testimony, you'll see that we address at least on the
18 pre-license how we look at quality assurance and
19 quality control. So that, I think, is what we talk
20 about particularly in terms of commission of proof
21 background. From those, we would establish the upper
22 control limits and that would be for the perimeter
23 monitor wells, as well as for the overlying and
24 underlying monitor well. And those upper control
25 limits are based on three parameters that we have

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1 identified that are consistent with guidance in terms
2 of detecting an excursion. So that's the basis for
3 those would come in.

4 We have a unique situation at Ross. The
5 underlying interval has naturally high chlorites, so
6 in lieu of chlorite as an indicator, we have proposed
7 sulfate in this situation and that was acknowledged by
8 the staff in their review.

9 So I think that gives you kind of the
10 overview of how that background and particularly
11 commission of proof background would be established
12 for this project. Those data and this is, I don't
13 know if you've ever seen one, but these wellfield
14 packages are, in my experience, in excess of 300 odd
15 pages. This is one component. Other components are
16 obviously geologic and so forth, hydrogeologic
17 potentiometric surfaces. But that's really a
18 significant part of that wellfield package.

19 I think I've kind of lumped these things
20 together and maybe if my colleagues have anything to
21 add to that, but I've covered the bases there.

22 JUDGE COLE: Each well that you initially
23 describe, these are called, these are also monitoring
24 wells, right?

25 MR. SCHIFFER: Yes, Judge Cole.

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1 JUDGE COLE: The wells that you described
2 and they're the first wells that are really put in as
3 far as the system, these are monitoring wells. Those
4 wells are used to collect the basic data.

5 MR. SCHIFFER: Let me clarify a little bit
6 for you, Judge Cole. I apologize. The wells that are
7 completed at the density of one well per two acres in
8 the wellfield area are typically used for in
9 production as injection and recovery wells. So in a
10 sense they are initially monitor wells, but they're
11 also used by the operator during mining and
12 restoration phases of the project.

13 JUDGE COLE: Thank you.

14 JUDGE WHITE: With regard to this, I
15 understand that there -- and you've helped us
16 understand that they're pretty strict definitions for
17 the UCLs and for the CAB, Commission-approved
18 background. And then they have specific purposes that
19 are different from each other as you pointed out.

20 In general use for our discussion, is
21 there any reason to distinguish the words background
22 and baseline?

23 MR. DEMUTH: May I answer that question,
24 Judge White?

25 JUDGE WHITE: Please do.

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1 MR. DEMUTH: I think some of the
2 nomenclature can be confusing, so I appreciate the
3 question since it's so important for many of the
4 contentions in this hearing. NUREG 1569 talks about
5 the initial phase of the hydrogeologic
6 characterization necessary for permitting. And the
7 terminology that's used is baseline. And so it's a
8 baseline groundwater characterization.

9 The term background ties into Commission-
10 approved background which is in this case a license
11 condition 11.3. That information is obtained from
12 wells which are installed as part of a wellfield.
13 Those wells per 10 CFR 40.32(e) cannot be installed
14 prior to achieving a license. So the condition 11.3
15 Commission-approved background and UCLs, those are a
16 post-licensing requirement. That is not referred to
17 information that is gathered prior to obtaining a
18 license during the application process.

19 JUDGE WHITE: Thank you. I'd like to take
20 a look at a diagram SEI014H, page 462, 2.2-1.

21 MR. CRYSTAL: Your Honor, could I
22 interrupt for just one second? I'm not sure I am
23 going to follow the proper procedure in terms of
24 noting a concern or an objection, but with regard to
25 Mr. Demuth's testimony regarding the question of what

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1 wells are permitted to be created pre-license or post-
2 license, the joint intervenors have a different view
3 of the legal aspect of that and have a concern about
4 whether or not sort of testimony is being accepted as
5 legal conclusions and we can sort of note that for the
6 record as an on-going --

7 JUDGE WHITE: That's fine. These are fact
8 witnesses.

9 MR. CRYSTAL: Yes, exact. We just want to
10 note that disagreement, that's all.

11 JUDGE WHITE: That's it. Thank you.
12 Okay, both FSEIS and the NRC license state and we've
13 already heard testimony that the licensee shall
14 establish background water quality data for the ore
15 zone overlying and underlying aquifers.

16 Is it correct, referring to this diagram,
17 that the overlying and underlying aquifer shown on
18 this figure are indicated as the SM and DM aquifers,
19 respectively?

20 MR. SCHIFFER: Yes, sir.

21 JUDGE WHITE: And the ore zone is
22 indicating on the picture in green. Is that correct?

23 MR. SCHIFFER: Yes, sir.

24 JUDGE WHITE: Thanks. Understanding that
25 this is just a schematic figure, not a detailed

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1 geologic cross section, these squiggly blue lines on
2 there, they indicate the regional direction of flow of
3 groundwater in the ore zone. Is that correct?

4 MR. SCHIFFER: Yes, sir. This is a
5 conceptual hydrologic diagram and it shows that
6 infiltration at the outcrop. And if you'll remember
7 your site visit, you kind of drove down the outcrop of
8 the Lanson Fox Hills and that precipitation and
9 infiltration enter the systems there and move into the
10 Powder River Basin to the west in a natural scenario.

11 JUDGE WHITE: So that's a natural east to
12 west flow generally or northeast to southwest flow?

13 MR. SCHIFFER: I would say naturally east
14 to west, yes, it's east. Yes.

15 JUDGE WHITE: And then am I correct that
16 groundwater pumping for industrial purposes or other
17 uses can create local reversals in this general
18 regional groundwater flow?

19 MR. SCHIFFER: Yes.

20 JUDGE WHITE: And finally, is the regional
21 groundwater flow we see, is that equivalent to what is
22 referred to as the regional hydraulic gradient which
23 we see a lot of in testimony.

24 MR. SCHIFFER: Yes, sir.

25 JUDGE WHITE: Okay, good. If we look at

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1 the FSEIS SEI Exhibit 009A on page 109, it states
2 "Condition 11.3 of the Draft Source and Byproduct
3 Materials License would require the applicant to
4 install a monitoring-well ring around the perimeter of
5 each wellfield, as well as monitoring wells in the
6 underlying and overlying aquifers." And if we go on,
7 it continues, it says "Prior to commencing ISR
8 operations these wells would allow sampling and
9 analysis of groundwater. That analysis would be used
10 to establish groundwater protection standards called
11 the Ross projects upper control limits or UCLs."

12 I'd like to focus on these perimeter wells
13 and on the establishment of this background
14 information that's going to be used for monitoring
15 excursion. Am I correct that UCLs established from
16 water sampled from the perimeter wells will be used as
17 indicators for detecting lateral and vertical
18 excursions after production has begun?

19 MR. SCHIFFER: Judge, in my experience,
20 the perimeter monitor well system is used to detect
21 horizontal movement away from the area of mining. So
22 it's horizontal, but there is not a vertical component
23 to that monitoring program.

24 JUDGE WHITE: But the monitoring wells
25 will establish or sample water for background from

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1 both the overlying and underlying aquifers as well,
2 the DM and SM that we just saw?

3 MR. SCHIFFER: Yes, sir. The perimeter
4 monitoring wells monitor horizontal and measure
5 horizontal water quality away from the ore body and
6 the overlying and the underlying. The wells installed
7 in those intervals would characterize that water
8 quality. So that would be the vertical, potential
9 vertical movement to the overlying and underlying.

10 JUDGE WHITE: Right, so the monitoring
11 well, in fact, will be able to detect by sampling the
12 DM and SM whether lixiviant has migrated up or down
13 from the ore zone aquifer and then moved out
14 laterally. Is that what you're saying?

15 MR. SCHIFFER: Yes, sir.

16 JUDGE WHITE: What role, if any, do the
17 background data from the monitoring wells play in
18 establishing goals for post-production groundwater
19 restoration?

20 MR. SCHIFFER: I should have been a little
21 bit clearer in my previous response, but the wells
22 installed at the density of one well per two acres in
23 the wellfield area and that are eventually used for
24 production injection are monitored to establish and it
25 typically called restoration target values.

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1 JUDGE WHITE: I will address those a
2 little later.

3 MR. SCHIFFER: Okay.

4 JUDGE WHITE: Right now I'm trying to
5 focus on the monitoring wells.

6 MR. SCHIFFER: Okay.

7 JUDGE WHITE: Do the monitoring wells, in
8 other words, the background data, these geochemical
9 analyses of water that you sample during your sampling
10 program from the monitoring wells, do those analyses
11 play any role in restoration of groundwater after
12 mining is ceased?

13 MR. KNODE: Judge, could we be more
14 specific so we understand. When you say monitoring
15 wells, there's really four distinct top --

16 JUDGE WHITE: Sorry, perimeter --

17 MR. KNODE: Perimeter ore zone monitoring
18 wells. Is that what you're --

19 JUDGE WHITE: Yes. The well perimeter,
20 not the production or injection well. And all of the
21 questions I want to ask for the next few minutes, deal
22 with the perimeter wells, not with the wells within
23 the well field per se.

24 MR. SCHIFFER: That's a good question,
25 Your Honor. And I spoke to it briefly before, but

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1 it's important to understand that the parameter suite
2 that we have proposed and that has been approved by
3 the NRC includes, is a very extensive parameter list.
4 So we know the water quality of not only the
5 excursion, the proposed excursion -- the approved
6 excursion parameters, but we know very well the
7 characteristics of that water quality. And so while
8 they are not used to evaluate success of restoration,
9 we do have that background established at that
10 perimeter ring.

11 JUDGE WHITE: Right.

12 MR. LAWRENCE: Can I add one point of
13 clarification?

14 JUDGE WHITE: Yes, please.

15 MR. LAWRENCE: The UCLs identify -- are
16 the initial indicator of whether or not an excursion
17 is occurring. Now we have a full suite of analyses
18 for those perimeter monitor wells. If it turns out
19 that the UCLs are exceeded and some type of corrective
20 action is necessary, there's often sort of a phased
21 approach where then you start to evaluate other
22 constituents that you know the background values for
23 to see if you truly have excursion occurring.

24 JUDGE WHITE: Right.

25 MR. SCHIFFER: It's important to

1 understand, too, that as part of the corrective action
2 for an excursion if it has not been corrected within
3 30 days, then uranium is one of the parameters that we
4 immediately have to begin monitoring for and that is
5 by regulation and that's in Chapter 11 of LQD's Rules
6 and Regulations.

7 JUDGE WHITE: Yes. Thank you. And many
8 of these answers that you folks are giving are going
9 to bleed into our discussions of Contention 2 as well,
10 and because there's a lot of sort of connection
11 between these topics, we'll be addressing them again.

12 For now and simply establishing
13 background, not talking about what it's used for or
14 how effective that is, let's see. For any particular
15 wellfield will the perimeter monitoring wells be
16 drilled prior to construction of the production and
17 injection wells?

18 MR. SCHIFFER: I'd like to defer to Mr.
19 Knode on that.

20 MR. KNODE: Could you ask that one more
21 time?

22 JUDGE WHITE: Yes, I was wondering about
23 the timing of both the construction of the perimeter
24 monitoring wells as well as the timing of the sampling
25 of the water that will be analyzed for background.

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1 Will that be done prior to construction of the main
2 wellfield?

3 MR. KNODE: Generally, the answer is yes
4 with one significant caveat and that is there are
5 these one well per two acres in the ore zone that are
6 internal to mine unit that will be constructed at the
7 same time as the perimeter monitoring wells and
8 sampled at the same time as the perimeter monitoring
9 wells as part of the wellfield package.

10 JUDGE WHITE: So all of the wells that
11 will be used to sample water for various background
12 purposes are going to be constructed and the water
13 sampled prior to drilling the much larger number of
14 wells that are going to be used for both injection and
15 extraction of bore ridge water.

16 MR. KNODE: Correct.

17 JUDGE WHITE: Okay. Thank you. In your
18 expert opinions, the geochemists in the group, will
19 construction of the monitoring well ring by itself
20 cause an increase in compounds both used for excursion
21 detection, compounds in lixiviant, or an increase in
22 uranium or other elements that are present within the
23 ore minerals?

24 MR. DEMUTH: Judge White, in our
25 experience we have not seen an adverse impact on water

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1 quality due to monitor well construction at facilities
2 for which we've been involved.

3 JUDGE WHITE: We'll talk more about that
4 when we talk about the monitoring wells in the
5 wellfield itself.

6 How would SEI ensure that water collected
7 from monitoring wells for the purpose of establishing
8 monitoring background does not already contain some
9 anomalous concentrations of lixiviant indicators owing
10 to the presence of lixiviant left over from the Nubeth
11 operations of the late 1970s? In other words, you
12 were saying that the primary indicator of an excursion
13 would be chemical compounds that would be present in
14 lixiviant, but we know that there's been previous ISL
15 operations that have injected lixiviant, so is there
16 some way to ensure that you're not already collecting
17 baseline that has some of these lixiviant components
18 in it?

19 MR. SCHIFFER: Judge, I'll take the first
20 pass at that. And I guess it's important to
21 understand Exhibit SEI 19 clearly depicts the
22 withdrawals over the past 30 years, as you have
23 alluded to, have induced a local drawdown in that
24 system. And those wells, and I could be corrected,
25 but I believe they pump approximately 30 to 40 gallons

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1 a minute and they've done that over a long time. We
2 see the effects of that. So in my mind it would be
3 virtually impossible for there to be any relevant
4 impact of that one five spot pattern today. So I
5 think that is not a consideration in my experience.

6 In terms of getting representative samples
7 and I think Ralph and the other experts can talk to
8 this probably better than me, but we have an
9 environmental management plan that will be reviewed by
10 NRC during their preoperational inspection. And one
11 component of that is how we develop our wells and how
12 we demonstrate that a sample is truly representative.
13 And so there are number of water quality criteria that
14 we utilize in the field when that development is
15 occurring. And in my experience, the key one is
16 obviously pH. We want to demonstrate that the pH is
17 representative. We also measure electrical
18 conductivity. We measure temperature and we will
19 periodically measure turbidity as well to demonstrate
20 that the water is representative. So that is the
21 first element in quality control check on how those
22 wells are developed. And I think that's important.
23 And that is part of the -- will be part of the
24 preoperational review of this project by NRC.

25 I didn't know if you all had any more to

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1 add to that.

2 MR. LAWRENCE: One other point is that
3 it's repeated sampling. It's sampling multiple times
4 to demonstrate that you've got a certain consistency
5 in the water quality, so that's another criteria that
6 you use to establish that you have representative
7 samples.

8 JUDGE WHITE: How long of a period does
9 the sampling from the perimeter monitoring wells, in
10 other words, over what period are they sampling?

11 MR. SCHIFFER: We have and it's basically
12 -- the samples have to be separated by at least two
13 weeks. So that's the consideration. More often than
14 not, it's -- as long as they're separated by two
15 weeks, and we cover them as we can get to them during
16 the sampling program.

17 JUDGE COLE: And the length of the
18 sampling program is what, two years for each sample?
19 So what? This is Dr. Cole.

20 MR. SCHIFFER: Dr. Cole, in my experience
21 and I think Ralph can talk to this better than me, but
22 really it's a matter of logistics in terms of getting
23 to this number of wells over a certain period.
24 They're being installed and the pumps are installed
25 and developed and sampled. The duration could last --

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1 Ralph, maybe you could weigh in?

2 MR. KNODE: Judge Cole, this is Ralph
3 Knode. I think the two-year period you may be
4 referring is the initial establishment of baseline
5 water quality throughout the project area --

6 JUDGE COLE: That's what we were talking
7 about.

8 MR. KNODE: I thought that Dr. White was
9 asking about the perimeter monitor wells associated
10 with the individual wellfields.

11 JUDGE WHITE: That's correct.

12 MR. KNODE: So if I can just maybe
13 elaborate, Judge Cole, yes, the two-year period is --
14 one of the two-year period -- is the initial water
15 collection period for the broader baseline water
16 quality. What I believe Judge White was asking about
17 is the -- the time period over which the sampling
18 would take place to obtain water quality information
19 from the perimeter monitor wells?

20 JUDGE WHITE: Yes.

21 MR. KNODE: Once those wells are installed
22 and developed and can be shown to be an accurate
23 representation of the water in the aquifer, then the
24 sampling starts, as Mr. Schiffer said, at a minimum of
25 two-week intervals and a minimum of four samples. So

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1 it could be as short as eight weeks, but realistically
2 it is probably something slightly longer than that.

3 JUDGE COLE: At that time, they're used
4 principally to identify excursions, is that correct?

5 MR. KNODE: Yes. Once that water quality
6 is established, as I just described, then those wells
7 would be used for identifying excursions. That's
8 correct.

9 JUDGE WHITE: If we look at this very
10 simple picture of a typical wellfield that's included
11 in the technical report, SEI014C, page 63, we see --
12 that diagram would show a group of -- this is not a
13 representation of necessarily any real one, but one
14 that is used for illustration of what a typical
15 wellfield would be like, is that correct?

16 MR. KNODE: Yes. That would be a
17 representation of what a wellfield might look like,
18 correct.

19 JUDGE WHITE: And we can see the squares
20 with the Xs in them would be the perimeter monitoring
21 wells?

22 MR. KNODE: Correct. The perimeter
23 monitoring wells that are on the ore zone, yes.

24 JUDGE WHITE: Okay. Are all of these
25 wells -- well, scratch that comment. Given regional

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1 hydraulic gradient, if this were representative of one
2 of your wellfields and the regional hydraulic gradient
3 is moving groundwater through the ore zone from east
4 to west, then would it be correct to say that the
5 monitoring wells on the east side of the wellfield
6 would be up hydraulic gradient?

7 MR. DEMUTH: Judge White, if I could
8 answer that? The monitoring well ring for a proposed
9 wellfield would entirely circle the proposed ore body.

10 JUDGE WHITE: As we see in this diagram?

11 MR. DEMUTH: Right. And so in the sense
12 of regional groundwater flow, yes, you would have some
13 monitor wells that would be on the upgradient side
14 from a regional flow standpoint and some wells that
15 would be on the downgradient side.

16 MR. KNODE: That won't be the case once
17 they're put into operation, Judge White. Once the
18 operations start and there's a bleed taken from that
19 wellfield overall, everything becomes upgradient.

20 JUDGE WHITE: That's --

21 MR. KNODE: If you're referring to prior
22 to any operations, you are correct, yes.

23 JUDGE WHITE: And I understand that the --
24 and we'll be talking about this later, but that the
25 mining design creates a hydraulic gradient and that

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1 draws in water, at least it's designed to draw in
2 water.

3 (Announcement from Operator.)

4 CHAIRMAN BOLLWERK: We're ready.

5 JUDGE WHITE: Okay. I'm almost done with
6 these perimeter wells. Although the perimeter
7 monitoring wells are situated outside the areas of
8 minable ore, would you expect background
9 concentrations of uranium and water sampled from the
10 OZ aquifer to vary from well to well? I mean we've
11 already said that we're sampling prior to mining,
12 sampling water for background. The upgradient side
13 may be different from the downgradient side.

14 Would the concentrations of ore minerals,
15 for example, from one well to another be different and
16 not to affect significantly the concentrations of
17 uranium in water sampled from the monitoring, the
18 perimeter ring monitoring wells? I can restate that
19 if it isn't clear.

20 MR. LAWRENCE: I think I understand the
21 question, Judge White. Yes, obviously, depending on
22 where that well is located, you may have considerably
23 different concentrations of a wide range of
24 constituents. As you have seen in some of the
25 diagrams, the ore bodies themselves are very

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1 irregularly shaped and so depending on where you might
2 be relative to that ore body, it can certainly change
3 the -- or have a different concentration in the water.

4 JUDGE WHITE: Okay. We'll get into the
5 details of how these monitoring wells operate later.
6 But would that fact that baseline collected from the
7 perimeter wells could vary significantly in uranium,
8 would that argue against using uranium as an indicator
9 for an excursion?

10 MR. LAWRENCE: Uranium is not typically
11 used as the initial indicator of an excursion. The
12 UCLs are more commonly alkalinity, conductivity, and
13 in this case sulfate.

14 JUDGE WHITE: Yes.

15 MR. LAWRENCE: So that's exactly the
16 reason why uranium is not typically used.

17 JUDGE WHITE: Okay, I understand that.

18 MR. DEMUTH: Judge White, if I could add
19 to that, part of the reason for the perimeter monitor
20 wells is to monitor for the most conservative species,
21 i.e., those of which are the most mobile.

22 JUDGE WHITE: Yes, we'll certainly get
23 into that as I understand that's a matter of debate
24 also. I'd like to explore that later on. But I think
25 we'll be exploring that in Contention 2.

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1 Finally, the last thing I wanted to ask,
2 water will be sampled from both the aquifers above and
3 below the OZ aquifer during this sampling period where
4 water is taken from the perimeter monitoring wells.
5 Are separate UCLs determined for each of the three
6 aquifers for the upper, lower, and ore zone aquifer?

7 MR. SCHIFFER: Yes, Judge.

8 JUDGE WHITE: Okay, good. We can move on
9 to a slightly different topic or when do you want to
10 take a break?

11 CHAIRMAN BOLLWERK: It's about 11 o'clock.
12 I think we've been going about an hour and a half now.
13 It may be a good point to take at least a brief break
14 and let everyone get up and stretch their legs and use
15 the restroom if they need to.

16 One thing I will talk with counsel briefly
17 when we come back is lunch plans, if you have any, in
18 terms of what you might be thinking about so we can
19 get some sense of how long we need to take for our
20 lunch break. So if you know what you're going to do,
21 share that with us and we'll talk about that a little
22 later.

23 It's about 5 'til 11. Let's take about a
24 10-minute break until around 5 after 11.

25 (Whereupon, the above-entitled matter went

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1 off the record at 10:56 a.m. and resumed at 11:10
2 a.m.)

3 CHAIRMAN BOLLWERK: All right. Let's go
4 back on the record, please.

5 We've just finished our brief morning
6 break and one question I guess I wanted to raise with
7 the parties before we begin with Judge White's
8 questions is about a lunch break. I understand one
9 thing we need to avoid is apparently the time period
10 from right about now, or a little bit before now to
11 afternoon time because apparently the high school here
12 has open campus and everybody takes off and
13 apparently, at least down the street where a lot of
14 the fast food restaurants are, it's chaos down there
15 for about an hour. So we wouldn't take a lunch break
16 until after 12:00 in any event.

17 But my other question I guess relates to
18 is are your plans to leave the building? Obviously
19 there's nothing here unless you bring it here. So are
20 people planning on leaving the building and going down
21 for lunch or do you have things coming in, or what is
22 everybody's sort of status, I guess?

23 MS. MONTEITH: Your Honor, the staff is
24 planning to spend lunch here.

25 CHAIRMAN BOLLWERK: Okay.

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1 MR PUGSLEY: Same here.

2 CHAIRMAN BOLLWERK: All right.

3 MS. ANDERSON: We could do that if we need
4 to.

5 CHAIRMAN BOLLWERK: I mean, could you have
6 -- I mean, you're going to bring --

7 PARTICIPANT: We're going to go get
8 something and --

9 CHAIRMAN BOLLWERK: Bring it back? I
10 mean, the question is can we do lunch in about an
11 hour? Do we need an hour-and-a-half? I guess that's
12 my thing. I want to give you all enough time to eat,
13 but I also want to be as efficient as we can. That's
14 my point.

15 PARTICIPANT: The staff would be fine with
16 an hour.

17 MR. PUGSLEY: And hour is fine.

18 CHAIRMAN BOLLWERK: Does that work with
19 you all? Okay. All right. Let's try an hour and if
20 for some reason it doesn't work this time, we know for
21 tomorrow and the next day that if we need to take a
22 little more time, we'll do that. Because again, I
23 want to give you enough time to be able to at least
24 get something in your stomach, but we do want to try
25 to be as efficient as we can.

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1 So, okay. At this point, Judge Cole, just
2 as a reminder, when we've had all the questions for
3 this particular panel, we will be taking a break so
4 that the parties can provide us with any cross-
5 examination questions. Then we'll have to take
6 another break off of that to talk about those
7 questions and decide which we will or won't ask. So
8 that may be coming up in -- I don't know when, but
9 that would be one of the next procedural steps we'll
10 have. So this is a reminder. Okay?

11 All right. Judge White?

12 JUDGE WHITE: Yes, the previous questions
13 that I've been asking, just to summarize, have been
14 dealing specifically with the perimeter monitoring
15 wells and background values that will be established
16 from those wells which are used for excursion
17 monitoring.

18 I'd like talk now about -- ask you and
19 have you talk about the background values that will be
20 established within the wellfield itself that will be
21 used for restoration standards. And I hope you'll
22 clarify if I'm misrepresenting where we're going with
23 these.

24 Okay. As stated previously in your
25 testimony here, background data determined from water

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1 sampled from wells within the wellfield prior to
2 operations beginning will be used to establish goals
3 for groundwater restoration after production has
4 ceased. Is that correct?

5 MR. KNODE: That would be correct, yes,
6 sir.

7 JUDGE WHITE: Yes. In addition to
8 establishing background values for restoration of the
9 OZ aquifer are backgrounds also determined for the SM
10 and DM aquifers above and below the wellfield per se
11 that are also used to establish restoration standards
12 for these aquifers, if needed?

13 MR. SCHIFFER: I'll take a first pass at
14 that, Judge. And I think it's important to clarify
15 here that the wells installed in the SM and DM
16 interval will be monitored for the extensive parameter
17 suite that's been approved by the NRC staff and it
18 includes parameters well beyond those that would be
19 used to establish the UCLs, so that background will be
20 there. But really the intent of that monitoring
21 effort is to establish those UCLs for excursion and
22 excursion monitoring and not necessarily for
23 restoration.

24 It's important to note that in the event
25 that there is an excursion into an overlying or

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1 underlying aquifer that throughout the restoration
2 that that well would have to be monitored for those
3 parameters to demonstrate that it too was brought back
4 to the restoration standards established. And that
5 would be the same for a perimeter well that goes on
6 excursion.

7 And so, in addition to that, if the area
8 and the volume that would be impacted by that
9 excursion would also have to be bonded for to cover
10 the restoration. So in the event of an excursion that
11 parameter suite would be monitored throughout the --
12 until that is corrected.

13 JUDGE WHITE: And that would take place at
14 the perimeter monitoring?

15 MR. SCHIFFER: Perimeter as well as the
16 overlying and underlying if it were not corrected.

17 JUDGE WHITE: I'd like to take up this
18 issue of the screening interval that is sampled. And
19 I know interveners raised an issue about the screening
20 interval for the pre-license site characterization
21 from the well clusters, but there's also been some
22 concern about the screening interval for the wells
23 within the wellfield that are going to be sampling
24 water that will be used to establish the Commission-
25 approved background. So if we can address that a

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1 little bit, that's where I'd like to hear from you.

2 And what I'd like to look at is the
3 rebuttal testimony of Mr. Schiffer, and that's SEI-
4 045, page 14, answer 10. And in this rebuttal
5 testimony you have statement in which you're
6 addressing the question of the sampling interval used
7 in the pre-license site characterization and you're
8 rebutting an issue that that sampling interval was too
9 small. And in the first sentence you state that in
10 fact it is more likely that the water quality from the
11 OZ aquifer sampled in the regional baseline monitor
12 wells is actually diluted compared to the water
13 quality in the mineralized zone since these wells all
14 were screened across intervals larger than the average
15 mineralized zone thickness.

16 And so, am I correct that what you're
17 saying is that the screening interval for sampling
18 water for the site characterization study is larger
19 than the mineralized zone thickness?

20 MR. SCHIFFER: Yes, Your Honor. In this
21 case we screened those wells over a larger interval in
22 order to characterize the extent of that OZ aquifer.
23 And so, we were not specifically looking at intervals
24 of mineralization or focusing on that. And in that
25 regard, if we could look at SEI-19, you'll see that in

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1 addition to that we were looking at areas both within
2 and outside of the mineralized areas.

3 JUDGE WHITE: All right. Did that
4 statement imply that -- well, let's see. Did that
5 statement mean to imply that you expect groundwater
6 within the narrow mineralized zone to contain
7 measurably greater concentrations of uranium and
8 radium-226 than the water above or below those zones?

9 MR. SCHIFFER: Your Honor, I'm not sure
10 that it meant to imply one, that that -- that one or
11 the -- that that's the case. I think in my experience
12 that that is typically the case, that the intervals
13 that have the mineralization do have unique water
14 quality characteristics. And I think that's fairly
15 common. And others may be able to weigh in more, but,
16 yes, I think that is the case.

17 JUDGE WHITE: Yes, and I was referring to
18 your implication when you say that -- you used the
19 words "diluted," and that sort of implied that you
20 were saying that the water above and below probably
21 diluted the contaminant concentrations.

22 With regards to this, Judge Cole, do you
23 want to put in here?

24 JUDGE COLE: No, not at this time. With
25 respect to the screening, I don't have any feelings

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1 for that situation.

2 JUDGE WHITE: Okay. The samples that are
3 collected for the Commission-approved background post-
4 license but prior to the beginning of operations from
5 the wells that you've discussed previously, will those
6 samples be screened through the narrower interval that
7 you discussed in that statement that we just read?

8 MR. SCHIFFER: So let me make sure that I
9 understand the question. We started out talking about
10 the overlying and underlying at the SM and the DM, but
11 now we're talking about those wells that are installed
12 to establish Commission-approved background in the
13 mineralized portion, correct?

14 JUDGE WHITE: Yes.

15 MR. SCHIFFER: So in my experience; and I
16 think these gentleman can probably talk to this a
17 little bit better, but in my experience those
18 intervals, those completions are typically discrete to
19 the mineral.

20 I mentioned earlier that those wells in an
21 operational scenario can be used for injection and
22 recovery wells, and at least in my experience you
23 generally want those wells to be focused on the
24 mineralization. And that's the approach that's taken.
25 Exposing the enriched groundwater to portions of the

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1 aquifer that don't have mineral really is potentially
2 a waste of the reagents of the oxygen and the
3 bicarbonate.

4 JUDGE WHITE: I understand that. So the
5 reason for sampling a narrow interval within the
6 mineralized zone to establish background for
7 restoration standards is that that's the screening
8 interval that you'd be using later on once production
9 begins for mining?

10 MR. SCHIFFER: Yes, Judge.

11 JUDGE WHITE: Is it fair to say then that
12 the water quality of the samples that will be
13 collected to be used for post-mining restoration are
14 likely to have the highest contents of contaminants of
15 any of the water within the OZ aquifer?

16 MR. SCHIFFER: Yes.

17 JUDGE WHITE: Is there a reason other than
18 the fact that it would be I assume economically a bit
19 more difficult to collect your water samples to
20 establish CAB from a larger screened interval that
21 would give a more accurate picture of the average
22 water quality of the OZ aquifer?

23 MR. SCHIFFER: I think the intent of using
24 the potential or the future operational wells is that
25 you're establishing Commission-approved background

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1 using wells that target that specific interval of
2 uranium. And that to try and establish CAB over an
3 interval that would be outside of the roll front
4 interval will misrepresent the water quality that you
5 need to get back to following mining.

6 JUDGE WHITE: But isn't there hydrologic
7 connection between the groundwater within an interval
8 that might only be a few meters thick and the
9 groundwater in the OZ aquifer that's above and below
10 the mineralized zone?

11 MR. SCHIFFER: And I think Ralph may be
12 able to expand on this, but in my experience the roll
13 front and the mineralization is in a large part driven
14 by local changes on that ore zone so that it's there
15 and it's in these discrete, say 10-foot intervals
16 based on local variations in the entire aquifer. And
17 so therefore, the mining really focuses on that
18 interval and not those above and below. And really
19 the intent of the mining -- and if you look at the
20 diagram; and I believe we have one that shows how the
21 mining wells are normally completed in a schematic,
22 you look to see that we're really trying to target
23 those portions of the ore body that have the
24 mineralization.

25 JUDGE WHITE: I understand that that's the

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1 efficient and the very logical way to proceed when
2 you're mining. What I'm addressing is whether that's
3 the most effective way to take a sample that you're
4 going to use to restore the groundwater quality in an
5 aquifer in general. And I don't want to dwell on it
6 too long, but my question would be are you looking to
7 only restore two meters of that aquifer, or when
8 restoration takes place are you going to be restoring
9 the water quality of the -- maybe not the entire
10 thickness of the OZ aquifer, but certainly more than
11 just a meter or two of the OZ aquifer? Do you
12 understand what I'm getting at?

13 MR. DEMUTH: May I attempt to answer that,
14 Judge White?

15 JUDGE WHITE: Please.

16 MR. DEMUTH: I think when you take a water
17 quality sample and establish Commission-approved
18 background in that, what we're referring to as a
19 smaller screen interval, what you're doing there is
20 you're documenting the water quality in the area, that
21 portion of the aquifer which you are going to disturb
22 during mining. So it makes sense to me then you don't
23 want to take a sample from a much broader -- and
24 vertical sense a broader sample because you want to
25 look at that area that you're impacting in your

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1 screening intervals, and that is what you're looking
2 to restore. So to influence that water quality by a
3 100-foot screen versus a 5-foot screen, I don't think
4 that's what you're trying to accomplish.

5 MR. SCHIFFER: Judge White, if I could add
6 to that? I think it's important to note that in terms
7 of analyzing the success of restoration it's important
8 to understand that the calculations for the pore
9 volume -- and we haven't gotten to defining that term
10 yet, but I think it's fairly well understood that
11 we're looking at a volume of water that's going to be
12 restored. And that's a metric that we use.

13 It's important to understand that when we
14 look at in particular on the licensing side and the
15 permitting side that we have a flare factor for how
16 that pore volume is calculated. And that accommodates
17 both a horizontal component as well as a vertical
18 component of that affected aquifer. And that in a lot
19 of ways I believe captures the concern that you have
20 here. And it varies by project, but there is
21 certainly a vertical flare component to those
22 calculations that capture the amount of water above or
23 below that particular mining interval that may have
24 been impacted during mining.

25 JUDGE WHITE: Judge Cole, do you want to

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1 weigh in?

2 JUDGE COLE: Yes, well certainly during
3 operations when you're trying to drain them from that
4 area you would want the screen located such that the
5 concentrating area of flow with the input that you're
6 only -- you're collecting the maximum amount in
7 contact with the uranium area so that you would be
8 able to concentrate that area and collect it much
9 faster. Is that a fact?

10 MR. KNODE: Yes, you want to have the
11 screen intervals to focus your solutions on the ore
12 zone only and not other portions of the aquifer that
13 don't contain ore. And I believe that's what you were
14 alluding to, Judge Cole.

15 JUDGE COLE: Yes.

16 JUDGE WHITE: I guess that's clear about
17 what the plan is.

18 The final thing that I wanted to ask is
19 about this issue of the effective wellfield
20 construction on water quality sampled for a baseline.
21 And you're well aware that interveners have asserted
22 that construction of a wellfield during conventional
23 drilling methods would by itself likely cause a
24 measurable increase in the concentration of uranium in
25 the groundwater within the ore zone owing to an

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1 increase in the oxidation state. In other words, the
2 drilling by itself introduces oxygen or other
3 compounds into the groundwater that raises oxidation
4 state. If this were accurate, then the background
5 values used to guide aquifer restoration would be
6 artificially biased toward greater concentrations.

7 In your opinion is it feasible that
8 uranium concentrations in groundwater could be
9 measurably increased by using conventional drilling
10 methods to construct the wellfield?

11 MR. KNODE: In my opinion that's not the
12 case, sir. There are examples of that that you could
13 go and look at. One that comes to mind is when you're
14 installing this wellfield monitoring network, you have
15 to put in a large number of wells and you sample those
16 wells and you will continue to sample those wells over
17 the life of the production, life of the restoration.
18 And there's never been in my experience a situation
19 where you have seen because of the initial drilling of
20 those wells and then the subsequent drilling of many
21 more injection and production mining wells. I've
22 never seen a situation where there's a noticeable
23 increase in things like uranium because of that
24 subsequent activity of mine installation. And my
25 testimony speaks to that.

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1 MR. DEMUTH: Judge White, if I could add
2 to that? In our experience; we worked at many, many
3 ISR facilities in Wyoming and Nebraska, Texas, we have
4 not seen an impact on baseline water quality in any
5 fashion in a way that Dr. Abitz speaks to in his
6 testimony.

7 In addition, STRATA has provided a
8 comparison of groundwater quality over time from the
9 wells that they've installed and we have not seen a
10 variation in that either. The drilling process simply
11 does not induce sufficient oxygen in a small diameter
12 bore hole to impact the geochemistry of an entire
13 aquifer system.

14 JUDGE WHITE: Okay. Can I just you to
15 clarify, who is "we?" I'm sorry. You said "we."

16 MR. DEMUTH: Petrotech Engineering as
17 consultants to many ISR operators in the U.S.

18 JUDGE WHITE: Okay. Thank you.

19 I think those are my questions for
20 STRATA's witnesses.

21 CHAIRMAN BOLLWERK: All right. Judge
22 Cole, did you have any questions for these witnesses?

23 JUDGE COLE: Well, one question that could
24 be answered by either of the groups. It has to do
25 with the perimeter monitoring well ring and how is the

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1 size of the perimeter monitoring well ring determined.
2 I think I know, but I'd like to have somebody speak to
3 that.

4 MR. SCHIFFER: I'll take a pass at that,
5 Judge Cole. And in this situation what we did is
6 actually develop a site-specific groundwater model
7 that brought in characteristics of the aquifer as
8 measured in at least seven aquifer tests, as well as
9 a model that captured the 30 years of withdrawals from
10 the industrial wells. We took that model and we
11 actually developed an in situ recovery wellfield. I
12 believe it was an exhibit that was brought up
13 previously, and I apologize for not remembering the
14 exhibit number, but maybe we could bring it up again,
15 that shows that wellfield.

16 And I can talk a little bit. Understand
17 I did not develop the model, but I will say that what
18 we did is we put into the model injection and recovery
19 wells, we balanced the wellfield in the model and then
20 we simply simulated an excursion. And in doing so,
21 what we were able to do was establish how quickly that
22 the changes in water level; and water level is
23 something that we measure every time we go to one of
24 these perimeter wells in the course of monitoring
25 every two weeks, and we're able to demonstrate that

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1 from distances of 400 to 600 feet that that excursion
2 could be detected. And so really that's the basis
3 for it.

4 I believe that as we move further into
5 this and particularly in Contention 3, we can get into
6 more detail about the modeling, but really we used a
7 site-specific model, we used an example of an
8 wellfield scenario; and I can't recall how many
9 injection and recovery wells there were, and simply
10 induced an excursion and then used the model to tell
11 us when we would see that response in those perimeter
12 wells at a given set of distances. And in fact, I
13 believe we could detect an excursion to 600 feet. We
14 have elected to go the more conservative route and
15 that perimeter ring is 400 feet from the wellfield
16 area.

17 MR. LAWRENCE: Judge Cole, if I might add?
18 This is Errol Lawrence from Petrotech. I did an
19 independent review of that model and I've actually
20 developed several models for other ISR sites. And the
21 methodology used in that modeling was consistent with
22 what's been used at other ISL/ISR facilities. And so
23 the approach is standard and it's an approach that the
24 NRC has accepted repeatedly.

25 JUDGE COLE: The perimeter monitoring well

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1 ring, how many different well packages are included
2 within the perimeter monitoring well ring? All of
3 them, or do you do a monitoring ring for each
4 individual well package?

5 MR. LAWRENCE: That's correct. So each
6 additional wellfield would have its own wellfield data
7 package and its own independent perimeter monitoring
8 network.

9 JUDGE COLE: And you determined that so
10 many feet distance was a reasonably safe distance so
11 that you were not interfered with by other abandoned
12 or un-abandoned wells in the area?

13 MR. LAWRENCE: Well, the determination of
14 whether or not you had abandoned wells would be
15 developed prior to the wellfield data package being
16 submitted. It would be part of the pump testing that
17 would be done for that particular wellfield, as well
18 as reconnaissance and -- basically site reconnaissance
19 identifying abandoned bore holes. So it would be a
20 little bit different issue.

21 MR. SCHIFFER: Judge, if I can expand on
22 that? One of the key elements of the wellfield
23 package would be to demonstrate that all of the
24 perimeter monitor wells respond to pumping within the
25 wellfield area. That is a critical metric that must

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1 be met. And that wellfield package, as you may know,
2 would go to NRC as well as the State of Wyoming for
3 review and approval at the state level and review and
4 verification at the NRC level. So understand that
5 while the distance for this project has been set, that
6 those wellfield packages would have to demonstrate
7 that those perimeter monitor wells all respond to a
8 stress; i.e., pumping within that wellfield area.

9 JUDGE COLE: Well, the reason why I'm
10 concerned about this area is because we've got a
11 couple of thousand wells out there, not all of which
12 are properly sealed. And in the process of the well
13 package you will identify hopefully any wells that are
14 not properly sealed that would interfere with the
15 operation of that well system. Now, how many wells do
16 you think would be involved in the packages, the well
17 systems that you've developed, because the numbers are
18 very small, relatively small number compared to the
19 total that has been identified and fixed.

20 MR. SCHIFFER: I'll take a first pass at
21 that, Judge Cole, and understand that we have a
22 specific license condition that requires that we
23 identify and reabandon all of the exploration holes
24 that were drilled in the past within the perimeter
25 monitor well ring prior to conducting the tests that

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1 would demonstrate the communication with the perimeter
2 monitor well ring as well as the lack of communication
3 with the overlying and underlying intervals.

4 In terms of the numbers of holes that are
5 present, I'm going to defer to Mr. Knode who has those
6 well in hand.

7 JUDGE COLE: Okay. Well, but how far does
8 the well have to be to demonstrate communication?

9 MR. DEMUTH: Judge Cole, Mr. Demuth. If
10 I could weigh in on this issue? The situation we have
11 here, as we've discussed I think in our testimony, is
12 common, where we have multiple historic bore holes.
13 In I believe Contention 3 we're going to get into more
14 detail on that.

15 I'm not aware that we have conclusive
16 evidence of holes that are improperly plugged at this
17 point. We are aware that STRATA has located a great
18 number of holes. We are aware that STRATA has
19 conducted pumping tests which demonstrate the
20 integrity of the confining zones. And certainly in
21 our experience we have conducted many pump tests at
22 over 40 wellfield and in regional tests just in our
23 company alone.

24 In some of those we have identified wells
25 that in fact were a problem. Those wells have been

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1 subsequently plugged. The vast majority of those,
2 even for sites with thousands of historic wells, we
3 have found that the enormity of cases that they do not
4 present a problem.

5 JUDGE COLE: Thank you.

6 CHAIRMAN BOLLWERK: Anything further you
7 have?

8 JUDGE WHITE: Nothing further.

9 CHAIRMAN BOLLWERK: All right. I think
10 the questions that I have potentially for this panel
11 I may defer until the end when we perhaps have
12 everyone back up. So at this point I think we have
13 concluded with our questions for you all at this
14 point. You may be relieved of your seats at the
15 witness table, but subject to being recalled,
16 obviously. So --

17 JUDGE WHITE: And thank you for your
18 responses.

19 CHAIRMAN BOLLWERK: All right. At this
20 point we will take a -- would 15 minutes be enough for
21 you all to generate any potential questions you want
22 to ask -- have us ask, rather, of this panel?

23 Actually, I should say one thing: Why
24 don't you stay there because we need to find out what
25 the cross-examination questions are. I apologize.

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1 So if we take a 15-minute break, is that
2 enough time for you all to generate whatever you might
3 have?

4 MR. PUGSLEY: Yes, Your Honor.

5 CHAIRMAN BOLLWERK: Okay. And again,
6 however you can present them to us -- we'll take them
7 handwritten, we'll take them typewritten, however
8 you've got them, but as long as they're readable.
9 That's the main thing. Thank you very much.

10 (Whereupon, the above-entitled matter went
11 off the record at 11:43 a.m. and resumed at 12:00
12 p.m.)

13 CHAIRMAN BOLLWERK: We've taken a break to
14 allow the parties an opportunity to provide with
15 proposed cross-examination questions for the SEI panel
16 on Contention 1. And each of the parties has provided
17 us with some questions, proposed questions.

18 Just as a procedural matter I'll mention
19 one more time that these questions, as well as all the
20 questions that you all provided us for both the direct
21 pre-filed testimony and the rebuttal testimony will be
22 preserved for the record. While we don't put them on
23 the record until after we issue the initial decision,
24 they are preserved and will be placed there at that
25 point so they will become a matter of public record.

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1 So what we're going to do now -- because
2 normally we would simply pick ourselves up and
3 probably go behind that wall and talk for a couple of
4 minutes. But Judge Cole is remote, we're going to be
5 going into our space we have over there, contacting
6 him. We're actually trying to -- we've scanned and --
7 or trying to email him the questions so he can
8 actually have them in his hand as he looks at them.
9 So we're going to need a couple of minutes. And we
10 will come back and see -- we want to make a decision
11 about which questions we will or won't ask.

12 Also, as a procedural matter, just let me
13 apprise you, I think what I would plan to do after
14 we've done with whatever questions we're asking this
15 panel is to go ahead and impanel the staff witnesses,
16 get the evidence in that -- the testimony and the
17 exhibits that support it and then probably take our
18 lunch break and we'll start fresh with the staff panel
19 after lunch with all the procedural items out of the
20 way. So that's kind of where we're headed.

21 All right. So we'll go ahead and take a
22 break. Hopefully we will not be more than 15 minutes
23 and we'll be back. And then we'll proceed from there.
24 Thank you.

25 (Whereupon, the above-entitled matter went

1 off the record at 12:02 p.m. and resumed at 12:22
2 p.m.)

3 CHAIRMAN BOLLWERK: So apparently the NRC
4 figured out how to fix my phone in my office so we can
5 talk to Judge Cole. And we have several questions we
6 would like to pose to the panel based on what we
7 received.

8 The first question is: If you only screen
9 the ore zone but admit that the pore volumes account
10 for vertical and horizontal migration of mining fluid
11 beyond the ore zone, then is that truly a
12 representative sample of the aquifer zone that is
13 affected?

14 And I can repeat that if you want me to.

15 MR. KNODE: Please.

16 CHAIRMAN BOLLWERK: One more time. If you
17 only screen the ore zone but admit that the pore
18 volumes account for vertical and horizontal migration
19 of mining fluid beyond the ore zone, then is that
20 truly a representative sample of the aquifer zone that
21 is affected?

22 MR. KNODE: Okay. It is correct, as we
23 discussed earlier today, that we do only screen the
24 ore zone. And what's going on between a production
25 well and an injection well is primarily horizontal

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1 flow with a very small component of vertical flow.
2 And so, what we are establishing Commission-approved
3 background on is that screen interval, that vertical
4 interval, and that interval is what we're going to
5 effect during the mining operation. And that same
6 interval is what we're going to effect or restore
7 during the restoration phase of the operations so it
8 makes sense to me that that would be the same vertical
9 interval that you would establish Commission-approved
10 background on.

11 MR. SCHIFFER: If I can quickly put a
12 point on that? Yes, we believe it is representative.

13 CHAIRMAN BOLLWERK: All right. Anything,
14 Judge White, you want to add at this point, or should
15 I ask the next question?

16 JUDGE WHITE: Go ahead.

17 CHAIRMAN BOLLWERK: All right. The second
18 question is: Again, this deals with screening. Would
19 screening monitor wells within the full ore zone
20 create operational problems?

21 I'm sorry, I think I read it wrong. Let
22 me try again. Would screening monitoring wells within
23 the full ore zone create operational problems? One
24 more time?

25 MR. KNODE: Yes, it would.

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1 CHAIRMAN BOLLWERK: Okay.

2 MR. KNODE: Because when you go in and
3 install the mining well component of your wellfield,
4 you have these very distinct intervals that you want
5 to operate in. So you would be forced with trying to
6 figure out the logistics of in the same well screening
7 a very large zone, sampling that and then coming back
8 and screening a very small zone. And that's not
9 practical, in my personal opinion.

10 MR. LAWRENCE: Plus you would also add an
11 additional pathway. There are concerns about things
12 such as abandoned bore holes. Well, in this case you
13 would actually be creating a conduit up to other
14 portions of the aquifer that you don't want to impact
15 while you're mining, so it would be kind of
16 counterproductive in terms of trying to maintain your
17 fluids within the ore zone.

18 JUDGE WHITE: I have no engineering
19 experience in constructing production wells for
20 anything. So are you saying that if you construct a
21 well that is screened through the full aquifer in
22 order to collect a water sample to establish
23 background, then you would have to completely re-
24 engineer that same well?

25 CHAIRMAN BOLLWERK: I think you may not be

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1 close enough to the microphone.

2 JUDGE WHITE: I'm sorry. Yes, excuse me.
3 To repeat: If you constructed a well that was
4 screened through say 100 feet of the OZ aquifer or
5 however thick -- 150 feet I guess is the average
6 thickness -- screened through that entire thickness
7 and then you wanted to convert that well after you did
8 your water sampling to a well that's going to be used
9 for mining in which it had a much narrower screen,
10 right, what would that involve? Would that involve
11 basically constructing an entirely new well, or is
12 there a way that you can pull the casing and change
13 the -- I mean, I don't understand the engineering
14 behind it. So you're saying it's completely
15 unfeasible to do such a thing. Why is that
16 unfeasible?

17 MR. LAWRENCE: You could go in and
18 reconstruct the well, but then to go back and make
19 that useable to monitor the entire interval wouldn't
20 be practical. You couldn't go back and forth.

21 JUDGE WHITE: No, no.

22 MR. LAWRENCE: Yes.

23 JUDGE WHITE: But you wouldn't. I'm not
24 talking about monitoring. I'm talking about
25 collecting the initial baseline water sample that's

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1 used to establish CAB and then go back, make your well
2 so it works for your mining purposes. And then
3 restoration time comes when mining is all done, refit
4 it again. So you'd only really be doing it twice so
5 that you'd be looking at water quality. You'd be
6 comparing apples with apples. You'd be comparing the
7 water quality of the entire OZ aquifer before you
8 started mining. Then you'd reduce it down, make that
9 into a useful well for your purposes. And then when
10 you're all done years later make that -- because I
11 know you're going to use the same well to establish
12 your post-mining water quality, then re-screen it back
13 up to a big interval and then look at that again. And
14 then you'd be comparing apples and apples.

15 MR. LAWRENCE: Right.

16 JUDGE WHITE: From an engineering
17 standpoint is that completely unfeasible to do such a
18 thing?

19 MR. KNODE: Can I suggest that we look at
20 SEI-003?

21 CHAIRMAN BOLLWERK: Just one second. We
22 have to put a password into a computer. Hold on.

23 JUDGE WHITE: I'm asking this because I
24 think it goes to the question that's being asked.

25 CHAIRMAN BOLLWERK: What's happened is we

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1 were trying to -- unfortunately the NRC computers that
2 we're using about every 30 seconds will come up with
3 a screen that you have to keep reentering the
4 password. And apparently between the two of us; we're
5 kind of using the same account, we managed to lock
6 ourselves out. So we need to take about a 10-minute
7 break and see if we can get back in so we can pull
8 that up and proceed. So I'm sorry, but let's take a
9 10-minute break right now. Thanks.

10 (Whereupon, the above-entitled matter went
11 off the record at 12:30 p.m. and resumed at 12:37
12 p.m.)

13 CHAIRMAN BOLLWERK: We've come back off
14 our break and we've gotten the computers working
15 again. We appreciate your indulgence in putting up
16 with this. You all know the only safe computer is one
17 you can't use, and these were very safe right then.

18 (Laughter)

19 CHAIRMAN BOLLWERK: So you'd asked us to
20 bring up an exhibit, I think. And I think we've done
21 that now, so we're good. You'd asked us to bring up
22 the exhibit. You were going to --

23 MR. KNODE: Yes, that's the correct
24 exhibit. Can we expand it, please? Can we scroll
25 down towards the bottom? There. Thank you.

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1 Can I continue, Judge White, with the
2 discussion?

3 JUDGE WHITE: Please do. Please.

4 MR. KNODE: If you would look -- this
5 exhibit was not intended for this discussion, but I
6 think we can make it work. If you look at the bottom
7 of this, the kind of tan crosshatched is the entire
8 ore zone and the red crosshatch is the zone that we
9 will mine in. It could be an injection well, it could
10 be a production well. It wouldn't make any different.

11 What we do when we install a well is we --
12 what we do is -- the term is called underreaming. You
13 can see how there's an enlarged area within that red
14 zone where we've taken a tool and we've cut away the
15 sandstone face to get a nice clean area to inject or
16 produce from.

17 So if I understood what you were asking,
18 could we not put a screen in through that entire ten
19 crosshatched area, effectively the entire OZ area,
20 collect water data, water quality data and establish
21 Commission-approved background and then go back and do
22 the mining, re-screen it?

23 JUDGE WHITE: That's correct.

24 MR. KNODE: Okay. if you think of now
25 this area, the enlarged area where the blue lines are

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1 coming in, if you think of that now as covering that
2 entire OZ interval, yes, we could collect water from
3 that. Correct. To go back in and only re-screen that
4 red area, which is where we want to mine in, we've
5 created pathways above and below that where our mining
6 solutions now cannot be contained or confined to the
7 area that we want to mine.

8 Those water -- if we're injecting say --
9 I think that's an easier picture in your mind. If
10 we're injecting that water we're injecting out that
11 screen, it can go anywhere now in that brown interval
12 because we've created a complete underream open face.
13 Whether we go back and screen at the screen interval
14 or not doesn't make any difference because we've
15 created an annulus or an open void that would allow
16 all of our injection solutions to go up and down that
17 complete interval.

18 So what's the alternative for that?
19 Because I think what I'm trying to tell you here from
20 an engineering and a well installation -- what you're
21 asking is not practical from a mining point of view.
22 In my opinion what that then would require you to do
23 is have a whole separate set of monitor wells every
24 two acres. So you have your -- now that becomes your
25 compliance point. Okay?

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1 So now you've established Commission-
2 approved background over the entire interval, as you
3 have correctly asked if we could do. And so now we're
4 going to monitor in this discrete interval, but the
5 compliance point is this fully penetrating well. So
6 when we go back to restore, we've now mined in 10
7 feet, but we're going to pull our fluids from 100 feet
8 and that's going to severely dilute the water quality
9 at your compliance point. So I think it defeats the
10 purpose when you kind of think it all the way through
11 to its logical end.

12 JUDGE WHITE: Okay. Thank you.

13 CHAIRMAN BOLLWERK: All right. Anything
14 further on that?

15 (No audible response)

16 CHAIRMAN BOLLWERK: All right. Did you
17 have anything, Judge Cole, on that response?

18 JUDGE COLE: No.

19 CHAIRMAN BOLLWERK: All right.

20 All right. Then the next question we have
21 is please further explain the focus on monitoring the
22 mineralized interval within the ore zone to establish
23 CAB for restoration goals.

24 MR. KNODE: Well, I think we have
25 addressed that, but the --

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1 CHAIRMAN BOLLWERK: If you feel you have,
2 you don't have to give us a further response.

3 MR. KNODE: No, I'll be glad to clarify if
4 I didn't get it right the first time. But we
5 established CAB, Commission-approved background, in
6 the ore zone because that's the zone that we are going
7 to effect during mining. And that is the area that --
8 you know, we are required to restore the areas that we
9 affect during mining. So it would be that same
10 discrete interval that we're mining that we are going
11 to be restoring. So that's the rationale for
12 establishing the CAB in that screened monitor
13 interval. I believe that was the question.

14 CHAIRMAN BOLLWERK: Right. Yes. All
15 right. Thank you.

16 All right. The next question would be is
17 the UCL established for each well in the monitoring
18 well ring and for the wells that are put in for the
19 overlying and underlying aquifers within the
20 wellfield? And there's sort of a sub-part to that:
21 Or are they established for the monitoring well ring
22 and for each of the underlying and overlying aquifers
23 in its entirety?

24 MR. SCHIFFER: I can answer that, Judge.
25 This is Ben Schiffer. And the UCLs for the perimeter

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1 monitor well ring are conducted on an individual well
2 basis. Similarly for the overlying and underlying
3 intervals the UCLs are established on an individual
4 well basis.

5 CHAIRMAN BOLLWERK: All right. The next
6 question then, in response to Judge White's question
7 whether construction of monitoring wells itself may
8 increase the presence of compounds later used to
9 detect excursions -- oh, I'm sorry. We'll go back to
10 the -- you had something you want to say, Judge Cole?
11 I'm sorry.

12 JUDGE COLE: Yes, pertaining to the UCL.
13 You say you determined that at the monitoring well,
14 and my question is exactly how do you do that? I
15 assume that you take a look at your chemical analyses
16 that could result in the sampling and what the
17 components are and you're going to pick out the ones
18 that are going to travel first, travel fastest to get
19 to that point or the ones that you commonly know are
20 present in the water, not in concentrations that might
21 create problems for you, but in concentrations that
22 would serve as a monitoring chemical.

23 MR. SCHIFFER: Judge Cole, this is Ben
24 Schiffer, and you're exactly right. So the water
25 quality is measured in the perimeter monitor wells as

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1 well as the overlying and underlying. And the upper
2 control limits are established, in our case, for the
3 perimeter monitor well ring three parameters that are
4 conservative in these hydrologic systems. That is
5 those parameters that we know will not be affected by
6 reduction-oxidation in the system. They include:
7 chloride, which is a very conservative ion; alkalinity
8 which is similarly conservative; and then we also us
9 electrical conductivity, which is a very good
10 indicator of overall water quality.

11 And so on a well-by-well basis the water
12 quality results are analyzed, the UCLs are
13 established. And the only unique aspect at the Ross
14 project is that the underlying interval happens to
15 have naturally elevated concentrations of chloride.
16 So in lieu of chloride we have proposed and NRC staff
17 have approved the use of sulfate as an excursion
18 parameter, and therefore upper control limits would be
19 established for sulfate in lieu of chloride in that
20 particular water bearing interval.

21 JUDGE COLE: Thank you.

22 CHAIRMAN BOLLWERK: All right. Anything
23 further, Judge White, that you have on that one?

24 JUDGE WHITE: No.

25 CHAIRMAN BOLLWERK: We're good? All

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1 right. Again, this is the next question which I'd
2 started on, but I'll now go back to the beginning and
3 read from the beginning.

4 In response to Judge White's question
5 whether construction of monitoring wells itself may
6 increase the presence of compounds later used to
7 detect excursions Mr. Demuth testified he has not seen
8 such increases. Can he explain how he would know that
9 such increases have occurred? Does he have data from
10 a well installed in an ore zone using non-oxygenated
11 fluids and nitrogen instead of air lifting? In other
12 words, does he have any data from a well installed
13 without using any oxygen in the drilling fluids or
14 development stage?

15 MR. DEMUTH: Your Honor, I have never seen
16 a well that's been installed with nitrogen. I have
17 never heard of a well being proposed to be installed
18 with nitrogen or even discussed in any fashion for an
19 ISR operation in the United States or anywhere within
20 the world.

21 CHAIRMAN BOLLWERK: All right.

22 MR. DEMUTH: With regard to the data pre
23 and post, we have several things: There are several
24 ways to evaluate water quality, and certainly in my
25 experience we've done plenty of sampling for

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1 environmental sites where we've looked at pre and post
2 water quality. We can also run resistivity logs to
3 evaluate filtrate invasion potential impacts on water
4 quality. Typically that's not done at ISR. But what
5 we do have is a system or a process with multiple
6 wells in an very small area that are sampled over and
7 over and over. And over the lifetime of these wells
8 thousands of water quality samples are collected.

9 So I would submit that the duration and
10 the number of samples are indicative of the water
11 quality and the usefulness of those wells and that we
12 don't see water quality changes in those wells over
13 time whether it's immediate post-drilling or a month
14 or a year or 10 years post.

15 CHAIRMAN BOLLWERK: All right. Judge
16 White, anything that you have in response to --

17 JUDGE WHITE: No.

18 CHAIRMAN BOLLWERK: No? Anything, Judge
19 Cole?

20 JUDGE COLE: No.

21 CHAIRMAN BOLLWERK: All right. The next
22 question for the witnesses: Will STRATA be required
23 to perform excursion monitoring during aquifer
24 restoration?

25 MR. SCHIFFER: This is Ben Schiffer.

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1 Judge Bollwerk, I'll take that. And I think quickly
2 if you take a look at the SER, the staff analyzed this
3 both in the license application and as I reference in
4 the SER actually at 87. We will be monitoring for
5 excursions through restoration and as well as into
6 stability monitoring. So, yes.

7 CHAIRMAN BOLLWERK: All right. Anything
8 further, Judge White?

9 JUDGE WHITE: Nothing, thank you.

10 CHAIRMAN BOLLWERK: All right. Let me
11 then go to the last question. Please compare the 400-
12 foot maximum distance to perimeter monitoring wells
13 with your experience at other ISR facilities.

14 MR. LAWRENCE: This is Errol Lawrence with
15 Petrotech. I've worked on about a dozen ISR sites and
16 typically the value of around 500 feet is most
17 commonly used, so 400-foot spacing for the monitor
18 well distance is actually conservative. It's a
19 shorter distance than most sites would typically have.

20 JUDGE WHITE: All right. And one of the
21 license conditions is that the monitor wells cannot be
22 outside the exempt aquifer. Is that correct? How far
23 does the exempt aquifer extend from a well field? And
24 this is more a matter of curiosity.

25 MR. SCHIFFER: In this case the exempted

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1 aquifer extends 100 feet beyond the perimeter monitor
2 well ring, and that is a site-specific calculation
3 based on groundwater velocity in this ore zone
4 aquifer.

5 JUDGE WHITE: I see. Thank you.

6 CHAIRMAN BOLLWERK: All right. Judge
7 Cole, do you have anything?

8 JUDGE COLE: No.

9 CHAIRMAN BOLLWERK: All right. Those are
10 the questions we have then. I'll raise this although
11 I'm hoping -- does anybody have any other questions?

12 MR. PUGSLEY: None from SEI, Your Honor.

13 CHAIRMAN BOLLWERK: All right.

14 MR. HARPER: None from the staff, Your
15 Honor.

16 CHAIRMAN BOLLWERK: No?

17 MS. ANDERSON: No, Your Honor.

18 CHAIRMAN BOLLWERK: All right. Good
19 answers.

20 (Laughter)

21 CHAIRMAN BOLLWERK: In theory this could
22 -- I don't even want to think about how long this
23 could go on, but we won't have to worry about that
24 this time, in any event.

25 So it's now 10 until 1:00. I think given

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1 the -- we took us a little longer with the technology
2 to get where we needed to be in terms of these
3 questions, so why don't we go ahead and take our lunch
4 break now and when we come back we'll swear in the
5 staff panel and do the exhibits for Contention 1. And
6 let's say -- well, we'll just round it off. This is
7 our first say. Let's say 2:00 for everybody to come
8 back. Hopefully that will give everyone enough time.
9 So we'll recess until 2:00 p.m. Thank you.

10 (Whereupon, the above-entitled matter went
11 off the record at 12:51 p.m. to resume at 2:00 p.m.
12 this same day.)

13 CHAIRMAN BOLLWERK: All right, can we go
14 on the record, please? All right, it's approximately
15 2 o'clock and we're back from our lunch break for the
16 afternoon. We had just finished with the Strata
17 witnesses for Contention 1 and now we're ready to move
18 to the NRC staff's witnesses for Contention 1.

19 Anything the parties need to raise for the
20 Board before we do that? I think we're in good shape.
21 All right, then let's go ahead and if you would go
22 ahead and empanel your witnesses or have them be
23 seated.

24 While they're coming up, I'm going to ask
25 a question. The original testimony had four people on

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1 it. Mr. Burgess?

2 MR. HARPER: So Mr. Burgess is a witness
3 for Contention 3, not for Contentions 1 and 2.

4 CHAIRMAN BOLLWERK: Okay, got it. All
5 right.

6 MR. HARPER: So we defer to you, Judge
7 Bollwerk, on whether you would like to swear him in
8 right now or wait until he comes up for Contention 3.

9 CHAIRMAN BOLLWERK: Let's wait.

10 MR. HARPER: His testimony is combined
11 with the other three witnesses.

12 CHAIRMAN BOLLWERK: Right. Under the
13 circumstances, if you don't mind, let's have him go
14 ahead and come up and let's swear him in. I do want
15 to ask him a question about his testimony and then he
16 can obviously go back to his seat because he obviously
17 has nothing to say about this one. It would better to
18 get him all sworn in and have his testimony because
19 the exhibits that are shared are one thing. The
20 witness statements are something else.

21 All right, good afternoon, everyone. If
22 you would, I would appreciate if all of you could
23 raise your right hand and please provide me with an
24 oral response to the following question. I'll start
25 at this end of the table. Do you swear or affirm that

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1 the testimony you give in this proceeding will be the
2 truth, the whole truth and nothing but the truth?

3 MR. SAXTON: Yes, Your Honor.

4 DR. JOHNSON: Yes, Your Honor.

5 MS. MOORE: Yes.

6 DR. BURGESS: Yes, Your Honor.

7 CHAIRMAN BOLLWERK: All right, and I guess
8 for the court reporter's benefit, we should have you
9 identify yourselves first. Let's do that, I'm sorry.

10 MR. SAXTON: John Saxton.

11 DR. JOHNSON: Kathryn Johnson.

12 MS. MOORE: Johari Moore.

13 DR. BURGESS: Tony Burgess.

14 CHAIRMAN BOLLWERK: All right. Are we in
15 good shape then, sir? All right.

16 Then let's go ahead and deal with your
17 testimony which is -- I want to get your testimony in
18 and then we'll -- you can go back to your seat until
19 Contention 3 comes up.

20 So we're dealing with two pieces of
21 testimony, NRC001 which is the direct prefiled
22 testimony, and NRC044-R2 which is the rebuttal
23 testimony which has been revised a couple of times.
24 So with respect to that testimony which each of you
25 are a party to, I'm going to ask you a second

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1 question. Was this testimony prepared by you or under
2 your supervision and direction and is it true and
3 correct to the best of your knowledge and belief? And
4 again, if you could give a response as we come down
5 the line.

6 MR. SAXTON: Yes, Your Honor.

7 DR. JOHNSON: Yes, Your Honor.

8 MS. MOORE: Yes, Your Honor. It's true.

9 DR. BURGESS: Yes, Your Honor.

10 CHAIRMAN BOLLWERK: Then let's go ahead
11 and we'll identify those two pieces of testimony and
12 have them admitted into evidence.

13 And Mr. Burgess, we'll be done with you
14 for the time being.

15 So we're looking for identification
16 purposes NRC001 which is the testimony of Johari
17 Moore, John Saxton, Kathryn Johnson, and Anthony
18 Burgess. And also for the purpose of the record
19 identification NRC Exhibit 044-R2 which is the
20 rebuttal testimony of Johari Moore, John Saxton,
21 Kathryn Johnson, and Anthony Burgess.

22 (Whereupon, the above-referred to
23 documents were marked as Exhibit NRC001
24 and NRC044-R2 for identification.)

25 That testimony has been identified for the

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1 record. Again, any objections from anyone,
2 recognizing our protocol? I don't hear any, so we
3 will admit into evidence Exhibits NRC001 and NRC044-R2
4 as they have been identified for the record.

5 (Whereupon, the above-referred to
6 documents were received into evidence as
7 Exhibits NRC001 and NRC044-R2.)

8 I thank you, Mr. Burgess. You can go back
9 to your seat now. Thank you, sir.

10 All right, let's then deal with really
11 briefly the other NRC exhibits that go with Contention
12 1 or in some instances other contentions, but we'll go
13 ahead and admit them all now.

14 The first one, NRC002, and again, these
15 are for purposes of identifying for the record, the
16 Statement of Professional Qualifications of Johari
17 Moore.

18 NRC003, the Statement of Professional
19 Qualifications of John Saxton.

20 NRC004, Statement of Professional
21 Qualifications of Kathryn Johnson.

22 NRC005, the Statement of Professional
23 Qualifications of Anthony Burgess.

24 NRC006A and NRC006B which constitute the
25 NUREG-1910, Supplement 5 to the Draft Report for

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1 Comment, of the Environmental Impact Statement for the
2 Ross ISR Project in Crook County, Wyoming; Supplement
3 to the Generic Environmental Impact Statement for In
4 situ Leach Uranium Milling -- I think it's supposed to
5 be Mining Facilities; the Final Report.

6 And then NRC007, Generic Environmental
7 Impact Statement for In situ Leach Uranium Milling
8 Facilities.

9 NRC008, the Generic Environmental Impact
10 Statement for In situ Leach Uranium -- is it Milling
11 or Mining? I think it's mining.

12 MR. PUGSLEY: It's Milling, Your Honor.

13 CHAIRMAN BOLLWERK: It's Milling, I'm
14 sorry. Milling Facilities. You had it right and I
15 had it wrong. I'm changing what you had correctly.
16 Chapters 5 through 12 and Appendices A through G, May
17 of 2009.

18 NRC009, the NRC Record of Decision for the
19 Ross Uranium In situ Recovery Project, April 24, 2014.

20 NRC010, the Errata No. 1 to the Ross FSEIS
21 which is April 23, 2014.

22 NRC011, which is Errata No. 2 to Ross
23 FSEIS, August 14, 2014.

24 NRC012, the Affidavit of John Saxton
25 Concerning Joint Intervenors' Motion for Summary

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1 Disposition of Contention 1 which is July 3 2013.

2 NRC013, NUREG-1748, Final Report,
3 Environmental Review Guidance for Licensing Actions
4 Associated with NMSS Programs, August 2003.

5 NRC014, Wyoming State Engineer's Office,
6 June 2011, Regulations and Instructions Part III:
7 Water Well Minimum Construction Standards.

8 NRC015, Groundwater and Wells, Johnson
9 Screens by Driscoll, F.G., from 1986.

10 NRC016 are -- and we did receive the
11 document that went into the EIE this morning so we'll
12 go ahead and admit that version.

13 Again, NRC016R, ND Resources, 1977. Has
14 the title changed at all?

15 MR. HARPER: No, the title is the exact
16 same.

17 CHAIRMAN BOLLWERK: Okay, Nubeth Joint
18 Venture Environmental Report, Supportive Information
19 to Application for Source Material License, Sundance
20 Project. I should check, I take it all the parties
21 got a copy of the revised exhibit?

22 MR. PUGSLEY: Yes, sir.

23 CHAIRMAN BOLLWERK: All right. NRC017,
24 Nuclear Dynamics, Quarterly Report, Summary of Water
25 Quality Program. Source Material License No. SUA-

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1 1331, Docket No. 40-8663. 1978.

2 NRC018, Nuclear Dynamics, 1980,
3 Restoration Report, Sundance Project.

4 NRC019, ND Resources, 1982, Assessment of
5 Restoration Activities, Sundance Project.

6 NRC020, Staub et al., NUREG/CR-3967, An
7 Analysis of Excursions at Selected In situ Uranium
8 Mines in Wyoming and Texas, 19868.

9 Then we skip to NRC043 which is the ISR
10 Wellfield Ground Water Quality Data, Irigaray Mine
11 Unit 1. NRC Report 2014.

12 NRC044-R2. We've already done that one.
13 That's come in.

14 NRC045 which is the Wyoming Department of
15 Environmental Quality, 2012 Letter re Ross ISR Project
16 Groundwater Reclassification.

17 NRC046 the Stumm and Morgan, Steady State
18 v. Equilibrium Report, pages 79-8 and that's 1996.

19
20 And one more, the NRC047, Stone and Truax,
21 2041, "In situ Recovery Uranium Mining Restoration
22 Challenges." So we've marked all those for
23 identification.

24 MR. HARPER: Your Honor, this is Richard
25 Harper with the NRC staff. There was one correction.

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1 We filed an updated exhibit list, I believe yesterday
2 evening with the updated or revised staff testimony,
3 the corrected one of the citation. That was NRC046,
4 page range was 79 through 81.

5 CHAIRMAN BOLLWERK: Okay. So 79 through
6 81, okay. That document is identified as corrected by
7 counsel. All right.

8 (Whereupon, the above-referred to
9 documents were marked as NRC002, NRC003,
10 NRC004, NRC005, NRC006A, NRC006B, NRC007,
11 NRC008, NRC009, NRC010, NRC011, NRC012,
12 NRC013, NRC014, NRC015, NRC016-R, NRC017,
13 NRC018, NRC019, NRC020, NRC043, NRC045,
14 NRC046, NRC047 for identification.)

15 So again any objections to the admission?
16 If not, then we will consider exhibits NRC002, NRC003,
17 NRC004, NRC005, NRC006A, NRC006B, NRC007, NRC008,
18 NRC009, NRC010, NRC011, NRC012, NRC013, NRC014,
19 NRC015, NRC016-R, NRC017, NRC018, NRC019, NRC020,
20 NRC043, NRC045, NRC046, NRC047 admitted into evidence.

21 (Whereupon, the above-referred to
22 documents were received into evidence as
23 NRC002, NRC003, NRC004, NRC005, NRC006A,
24 NRC006B, NRC007, NRC008, NRC009, NRC010,
25 NRC011, NRC012, NRC013, NRC014, NRC015,

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1 NRC016-R, NRC017, NRC018, NRC019, NRC020,
2 NRC043, NRC045, NRC046, NRC047.)

3 Did I miss anything?

4 MR. HARPER: No, sir.

5 CHAIRMAN BOLLWERK: All right. And I
6 should mention that just for the record that the
7 exhibit -- hold on one second here. NRC016, there's
8 actually a dash, -R is the actual exhibit number.

9 All right, so those are all in evidence.
10 The panel is here. I think Judge White may have some
11 questions.

12 JUDGE WHITE: I do, thank you. The first
13 question goes to the first question I asked Strata's
14 witnesses and that is whether you have anything that
15 you'd like to add to what has already been stated
16 regarding the sort of the definition or meanings of
17 the terms background water quality, baseline data,
18 excursion monitoring upper control limits or UCLs, and
19 Commission-approved background or CAB. Do you feel
20 those have been adequately explained so far? Is there
21 anything you'd like to add to clarify those terms?

22 MR. SAXTON: Your Honor, I just want to
23 make one comment on the background and baseline. The
24 regulations in Part 40 actually use those
25 interchangeably. When we consider background is just

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1 a sample that was acquired before operations begin.
2 It could be baseline if you're using that in the
3 future as a measure of any impacts. So that's how we
4 interpret it.

5 JUDGE WHITE: A number against which to
6 compare another number?

7 MR. SAXTON: Yes.

8 DR. JOHNSON: If I may, Judge White, for
9 the purposes of the environmental impact statement, we
10 noticed early on that the two terms which are often
11 used interchangeably but may not be, would cause some
12 degree of confusion or just a mixup. And so that's
13 why we made the decision that we wanted to be very
14 clear in what data set we were referring to. So we
15 adopted the terminology which we defined at some point
16 in the SEIS what those terms meant. And that's why we
17 went then to the pre-license site characterization and
18 post-license pre-operational terminology to try to
19 differentiate and distinguish what we were talking
20 about.

21 CHAIRMAN BOLLWERK: Can I just ask one?
22 Is that terminology now going to be adopted in all
23 FSEISs going forward or is this only for Strata?

24 MS. MOORE: Your Honor, not necessarily.
25 It was unique to the situation where we thought it was

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1 warranted to clarify those terms and there's no reason
2 why necessarily future SEISs would need to do that.
3 I'm hoping through this hearing we'll be able to
4 establish what's meant by that so it's not confusing
5 in the future.

6 CHAIRMAN BOLLWERK: All right, well, maybe
7 the confusion will continue and maybe it won't. We'll
8 have to see. All right, go ahead.

9 JUDGE WHITE: Getting to this issue of how
10 the samples are collected to establish CAB,
11 Commission-approved background, and we heard testimony
12 confirming that the samples in the monitoring wells or
13 the sampling wells that are going to be established
14 within the wellfield, are going to take samples from
15 a very narrow interval, something on the order,
16 correct me if I'm wrong, but seven, eight feet perhaps
17 within an ore zone. And that wells will be screened
18 to take water from this. Is this consistent with how
19 you view the sampling program in License Requirement
20 11.3(a) in the license?

21 MR. SAXTON: Yes, it is, Your Honor.
22 Typically, the zones are on the order of 16 feet,
23 instead of 7 or 8, it's more. And that's based on a
24 lot of financial assurance, the calculations they have
25 to determine what the average core thickness screened

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1 intervals. The reason why we use that as the
2 Commission-approved background is because those are
3 the wells that are going -- we want the same wells
4 before operations to be the same wells that are
5 measured restoration success. So therefore, those are
6 screened in just that interval. On the surrounding
7 perimeter well ring, they would also be screened on
8 the same intervals.

9 So when they initially do the well
10 testing, they have to a pump test and they have to
11 show that those wells are interconnected, they are
12 indeed on the same intervals for our -- to be able to
13 say that we can monitor for early time detection of a
14 new release through the excursion monitoring program.

15 What happens is the background is
16 established and then after mining we use that
17 background that we snapshot that narrow screen right
18 in to measure the success of the restoration. So
19 that's how -- at the same wells. So that's how we use
20 those.

21 JUDGE WHITE: During mining, throughout
22 the life of a wellfield, will the screened interval be
23 changed as the mining company is essentially mining
24 different horizons within the ore zone?

25 MR. SAXTON: They, in their license

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1 application they would tell us that there's going to
2 be stacked ores, bodies within that ore zone and that
3 they intend to do that, in other words have stacked
4 ore zones.

5 If they do have stacked ore zones, then
6 each of those intervals will have to be monitored on
7 the surrounding perimeter ring. Generally, the
8 production area that's closest to that weld would be
9 that horizon that that weld was screened at so that we
10 have early time detection of that horizon.

11 But they won't go -- it would be difficult
12 to go and change the -- start operating on a lower
13 zone and then use the same wells to go in the upper
14 zone. You have to put in separate wells to do that.
15 But they have to establish the baseline before any
16 operations are done if they want to do multiple
17 horizons.

18 JUDGE WHITE: Okay, that's very clear. I
19 just wanted to reiterate that in fact for the company
20 to mine a horizon that has maybe 30 or 40 feet above
21 a horizon that they've started out mining, they would
22 have to drill a brand new well and screen it for that
23 new horizon? Is that what you're telling me?

24 MR. SAXTON: That's generally what
25 happens. Sometimes they do have multiple licenses for

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1 each well, but that's only when they overlap.
2 Sometimes the stacked horizons don't overlap each
3 other.

4 JUDGE WHITE: All right.

5 MR. SAXTON: Before they even start mining
6 though they have to get baseline on all of the
7 horizons.

8 JUDGE WHITE: Right, out in the monitoring
9 well, but where I'm talking about the baseline that's
10 established for CAB within the wellfield.

11 MR. SAXTON: Within the wellfield, too.

12 JUDGE WHITE: Yes. I'm sorry to be dense
13 on this. So the Commission-approved background will
14 be established from a narrow horizon within a specific
15 vertical ore bed if there are stacked ore beds and
16 that will then -- that screen level will stay there
17 and then that well will also be the well that's used
18 to monitor water after mining ceases for restoration
19 purposes.

20 MR. SAXTON: That's correct.

21 JUDGE WHITE: To compare. So the screen
22 interval in the well won't be changed ever during --

23 MR. SAXTON: No, it won't.

24 JUDGE WHITE: Okay. That's good. I guess
25 you've already answered this question and that is that

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1 establishing CAB in a horizon this narrow and using
2 that narrow horizon to sample water for restoration
3 comparison is common practice at ISL operations, is
4 that correct?

5 MR. SAXTON: That is correct.

6 JUDGE WHITE: So we've heard that the
7 reason this is done is for engineering and mining
8 purposes. I don't know how to phrase this other than
9 to say that in a perfect world where finances didn't
10 play a role, in your opinion would there be a reason
11 and would it be better procedure to take a wider
12 sample through an aquifer, in this case through the OZ
13 aquifer for both establishing CAB and for assessing
14 the success of restoration. Or is there a scientific
15 reason why that would not necessarily be any better at
16 all?

17 MR. SAXTON: My opinion is it's better to
18 have to have it in a narrow zone because we're just
19 measuring what the impact is during operations on that
20 zone itself. Typically, a lot of the aquifers that
21 are under ISRs are fluvial in nature and the vertical
22 anisotropy is such that it's on the order of 10 to
23 100. The horizontal is 10 to the 100 times that in
24 the vertical direction. And you can calculate what
25 the flare factor would be going to vertical. And it's

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1 really minimal at that range. So when we measure the
2 restoration, we want to instead of going throughout
3 the whole interval, we can see exactly what the impact
4 is to the ore zone quite easily and measure that as
5 how far efficient they've restored things.

6 If it goes to the baseline that was
7 originally or to MCL, then it would be fine. If they
8 do have to use the third standard, an ACL, what we
9 will do is look at the wells at a perimeter ring as
10 the point of exposure and that would be more of the
11 quality outside of the ore zone. So that baseline
12 would be what we would use if we're looking at that as
13 like a point of exposure. So it has to be protected
14 there.

15 JUDGE WHITE: I see. That's helpful.
16 Thank you. That's all I have about the screening
17 issue.

18 Judge Cole, do you have anything to add
19 regarding this issue of screen intervals?

20 JUDGE COLE: Just a question for
21 clarification. How often do you have these multiple
22 horizon situations?

23 MR. SAXTON: It's very site specific.
24 What normally happens if they have a well that's
25 screened in multiple horizons, they'll use that as a

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1 pumping well and we would require them to abandon that
2 well because it's screened over multiple horizons and
3 we start operation at one horizon, it will provide a
4 conduit for fluid migration to maybe in another part
5 of the ore zone that's not going to be mined. And so
6 we would require them to do it.

7 But as far as the number of wells, I have
8 to go back and look at all the different ones. I know
9 there's a lot in the State of Wyoming because of the
10 fluvial nature of it that they do have them, but it's
11 site specific actually. Generally, it's usually just
12 one well that's framed in one stacked horizon. I
13 don't remember very many that are screened over
14 multiple horizons.

15 JUDGE COLE: What do you do in that case?
16 Do you have a multiple horizon plan? Do you just go
17 between the two uranium-laden layers and consider
18 that one well?

19 MR. SAXTON: Yes. They usually screen if
20 it's two adjacent abutting ones, they'll screen over
21 both of them and then they'll get the quality for that
22 for both of them.

23 JUDGE COLE: With respect to recovery,
24 just consider that one area to be recovered?

25 MR. SAXTON: That's correct, Your Honor.

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1 JUDGE COLE: Thank you.

2 JUDGE WHITE: Next issue?

3 CHAIRMAN BOLLWERK: I think we're good.

4 JUDGE WHITE: I would like to just touch
5 again on the issue intervenors have raised many times
6 about the effect of drilling on the oxidation state
7 within the ore zone which in turn can affect the
8 amount of uranium that is in solution versus tied up
9 in the ore minerals.

10 Do you see any possibility of any
11 significant increase in oxidation at the site of
12 drilling or at the bottom of the hole as a result of
13 developing a wellfield?

14 DR. JOHNSON: Judge White, when we -- when
15 the data were analyzed that we used in the SEIS, we
16 were mindful of the theoretical possibility and also
17 paid attention to the fact that at the very -- when
18 the wells were initially done, like that very day or
19 within a couple of days, there did appear to be some
20 elevated levels. And Strata did not include that data
21 in their quarters for monitoring. So that was not
22 included.

23 The other data appeared to me to be very
24 valid and to show no impact from oxidation for a
25 variety of reasons. One, because if you look at the

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1 constituents beyond just uranium, for example, ammonia
2 was present in most of the water quality. Ammonia
3 only exists under non-oxidizing conditions. And
4 ammonia was present. There were some that were less
5 than detectable, but many of them had the presence of
6 ammonia.

7 As well as we looked at the range of
8 uranium, the max. and the min., the maximum and
9 minimum over the sampling period, the four quarters
10 and then two years, eight quarters. And that range
11 was essentially the same over that period of time. So
12 then there were a couple of wells, in fact, the well
13 that had the highest concentration of uranium rather
14 than showing a decline over that two-year period that
15 you would expect, if it started out being biased by
16 oxidation and it would be slowly reduced over time, it
17 actually increased slightly which is in opposite to
18 some of the wells had a very, very slight decrease.
19 So there really wasn't to me a compelling, any
20 compelling evidence that there was any systematic bias
21 in those data due to perturbations that could have
22 been caused by the well installation or sampling.

23 JUDGE WHITE: Judge Cole, do you have
24 anything to add to this issue?

25 JUDGE COLE: Yes. You say there's a lot

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1 of ammonia there, but it would be that the ammonia
2 would be dissipating and then oxidation could not take
3 place, or the ammonia was being would be oxidizing and
4 released from the well?

5 DR. JOHNSON: Judge Cole, yes, nitrogen in
6 any of those cases is in a reduced state and if they
7 were oxidized it would be nitrate or nitrite which
8 wasn't present. So there might be some ammonia that
9 was being dissipated or released or any of those
10 scenarios, but it didn't appear that it was oxidized
11 to the nitrite or the nitrate.

12 JUDGE COLE: Thank you.

13 JUDGE WHITE: Are you aware of any studies
14 that have been done using alternative drilling methods
15 such as those suggested by intervenors' expert
16 witnesses that have then been compared with drilling
17 done by standard industry methods that show any
18 difference in those two?

19 DR. JOHNSON: Judge White, I am not aware
20 of any studies that were done for that particular
21 purpose that you're describing. However, I am aware
22 of some real recent work done. In fact, it's one of
23 our exhibits and the exhibit is an actual presentation
24 of some of the initial results where --

25 JUDGE WHITE: Excuse me, I'm sorry. Which

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1 exhibit is that?

2 DR. JOHNSON: The exhibit --

3 MR. SAXTON: 47?

4 DR. JOHNSON: Yes, NRC047.

5 JUDGE WHITE: Thank you.

6 DR. JOHNSON: And in this study, the
7 researchers were making every attempt to preclude
8 oxygen and they went to some great lengths in the
9 sampling to try to prevent oxygen. And indeed, the
10 uranium concentration that was measured in the ore
11 zone that was sampled under those conditions shows, I
12 believe it's -- I think it's 22, the PDF page 22.

13 So the value that was reported in that
14 particular study was 0.11 milligram per liter of
15 uranium which is within the range of what the data
16 that we had for the Ross project.

17 JUDGE WHITE: That's all the questions I
18 have about the oxidation related to drilling.

19 Judge Cole, do you have anything to add?

20 JUDGE COLE: No.

21 JUDGE WHITE: I'm good.

22 CHAIRMAN BOLLWERK: You're finished?

23 Judge Cole, do you have any other questions for the
24 panel?

25 JUDGE COLE: Well, there's one question

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1 here I don't think has been answered yet. To the
2 extent witnesses' rebuttal testimony at NRC044-R, page
3 17, it states three criteria for successful
4 restoration any one of which is positioned to meet the
5 regulatory requirement. Three are listed. First is
6 the restored and condition approved background. Two
7 is restore to a value given in the table in paragraph
8 5(c) of Appendix A if the constituent is listed in the
9 same way as the background level of the constituents
10 below the value listed. Or three, restore to an
11 alternative concentration limit established by the
12 Commission which is subject to a finding that a
13 concentration is reasonably achievable and will not
14 pose a substantial presence for potential hazard to
15 health and the environment.

16 Are these criteria listed in order of
17 priority?

18 MR. SAXTON: In the past, they've been
19 talked about as being primary and secondary standards.
20 In the regulations, they are either actually either
21 or. The first two, the Commission-approved background
22 or Table 5C was actually MCL at the time, so if you
23 say MCLs or Commission-approved background, they are
24 interpreted as posing no incremental health hazard or
25 pose a harmful situation. So if you achieve those,

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1 then there's no need to do any hazard assessment or
2 anything else.

3 On the other hand, if you can achieve
4 those and you need an ACL, there's things that you
5 have to do for us to approve that, one of which is to
6 make sure that it's ALARA and then you have to do
7 hazard assessments to ensure that the levels that you
8 propose, or your licensee proposes for the Commission
9 to approve, are protected and safe.

10 JUDGE COLE: Do you have to file for a
11 license amendment then?

12 MR. SAXTON: That is correct.

13 JUDGE COLE: All right, thank you.

14 CHAIRMAN BOLLWERK: Anything further you
15 have on that?

16 JUDGE WHITE: No.

17 CHAIRMAN BOLLWERK: All right, I think
18 again my questions I am going to defer until I think
19 we're going to do a separate panel at the end.

20 All right, at this point, I'll give you
21 all 15 minutes again, is that appropriate if you have
22 any additional cross examination questions you would
23 like the Board to ask this panel of witnesses? Why
24 don't we go ahead and take a break. It's about 25
25 'til, so why don't we say -- it would be about 10 'til

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1 3, right, exactly.

2 (Whereupon, the above-entitled matter went
3 off the record at 2:36 p.m. and resumed at 2:51 p.m.)

4 CHAIRMAN BOLLWERK: Can we go back on the
5 record? We do have one question and we are going to
6 go ahead and briefly conference with Judge Cole. I
7 don't think it should take all that long and then
8 we'll be back and proceed from there.

9 I should mention one thing. I should have
10 mentioned it before, to the degree you have questions,
11 if you want to put the name of the party on top on
12 them, we've been doing that so when we put them on the
13 record it will be clear who was asking them. But I
14 prefer to have your handwriting on there rather than
15 mine. It might make it look like I'm changing your
16 questions, although I could do that, I suppose. But
17 anyway. In fact, we might. Who knows? In any event,
18 if you could just mark your questions that way it will
19 be clear for the record exactly who proposed them.

20 All right, why don't we go ahead and take
21 a brief recess. I don't think this will take
22 particularly long. We'll be back in a couple of
23 minutes and then the plan from there would be --
24 actually, I'll give you something to think about,
25 given where we're at. It looks like I do believe

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1 we're going to finish Contention -- at a minimum,
2 we'll finish Contention 1 today. What would be your
3 preference, if any, in terms of starting tomorrow
4 morning? Because I think we're willing to start
5 fairly early if you all are interested in doing that.
6 We don't have to talk about it right now. Just think
7 about it among yourselves and we'll come back to that
8 after we get done with Contention 1.

9 MR. PUGSLEY: Your Honor, if I may, just
10 really quickly.

11 CHAIRMAN BOLLWERK: Sure.

12 MR. PUGSLEY: We had sent the
13 communication to all counsel and the Board regarding
14 a potential revisiting of the site tour of Nichols
15 Ranch. And I just wanted to let you know that for
16 timing purposes we probably would need to let Your
17 Honors' personnel know some time tomorrow morning
18 whether or not the Board would like to do that.

19 CHAIRMAN BOLLWERK: Got it. All right.
20 Again, as I had mentioned I think before, and I know
21 I mentioned in the presence of counsel during the site
22 visit, this is obviously the first priority. And so
23 we have to get the hearing done at a minimum. I don't
24 want to drive folks for the site visit to do things
25 that aren't in their best interests in terms of the

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1 hearing. So we can talk when we get back about
2 tomorrow and when we want to start. Very good.

3 Okay, we're going to take a recess and
4 we'll be right back.

5 (Whereupon, the above-entitled matter went
6 off the record at 2:53 p.m. and resumed at 3:05 p.m.)

7 CHAIRMAN BOLLWERK: All right, we've just
8 come back from a brief break for the Board to consider
9 the question, the potential cross-examination
10 question, provided by one of the parties. I think we
11 were going to ask the question, we're going to change
12 it just slightly to address a concern we had. The
13 question is does the Strata license require that the
14 perimeter monitor wells be fully screened in the ore
15 zone aquifer as recommended in NUREG 1569?

16 MR. SAXTON: I'd have to review the
17 license.

18 MS. MONTEITH: Your Honor, would it be
19 possible to pull up the license as an exhibit?

20 CHAIRMAN BOLLWERK: It is, although it's
21 fairly lengthy.

22 MR. PUGSLEY: SEI010 which is the Safety
23 Evaluation Report, 287, page 287.

24 CHAIRMAN BOLLWERK: Thank you.

25 MR. SAXTON: For the perimeter monitoring

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1 well ring we would require fully penetrating wells.

2 CHAIRMAN BOLLWERK: I'm sorry?

3 MR. SAXTON: For the perimeter monitoring
4 well ring, the overlying and underlying is fully
5 penetrating wells.

6 JUDGE COLE: Forty three.

7 JUDGE WHITE: Does that mean screened?

8 MR. SAXTON: Screened throughout the
9 entire --

10 JUDGE WHITE: Of the aquifer.

11 MR. SAXTON: Yes.

12 JUDGE WHITE: Am I mistaken that I thought
13 I heard testimony earlier saying that the water that
14 was sampled in the monitoring wells would be -- during
15 monitoring, would be sampled only in the narrow
16 horizon into which the lixiviant is being introduced?

17 MR. SAXTON: Yes, that's -- there's a
18 distinction between whether or not a well should be
19 fully penetrating or not. There's a difference of
20 opinion whether the dilution effects of the fully
21 penetrating well diminishes your ability to detect
22 monitoring program whereas a partially screened well
23 may not detect an excursion that might occur in an ore
24 zone above it or below.

25 Some licenses, we actually require a well

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1 that's screened in a specific horizon within the ore
2 zone. And that's what I was referring to when I was
3 referring to the partially penetrating well.

4 JUDGE WHITE: But in this license?

5 MR. SAXTON: In this license, it's going
6 to be a fully screened well.

7 JUDGE WHITE: Okay, so the former comment
8 about it being narrow screened for this particular --
9 for the Ross --

10 MR. SAXTON: For Ross.

11 JUDGE WHITE: Was not, correct?

12 MR. SAXTON: No, it wasn't.

13 JUDGE WHITE: I see. Judge Cole, do you
14 have something to add?

15 JUDGE COLE: No, but I could ask what do
16 you mean by full penetration? That's fully screened?

17 MR. SAXTON: That would be fully screened
18 -- generally, there's multiple sand horizons and it
19 would be screened throughout that sand horizon.
20 That's what I meant.

21 JUDGE COLE: What do you mean horizon?

22 MR. SAXTON: In the ore zone, the ore body
23 how they defined it is there's the stacked sand bodies
24 from different channel deposits. In some cases, one
25 of those sand bodies will be hosting the ore zone.

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1 And if they're mining in that specific channel
2 deposit, the permanent well ring would be in this case
3 fully penetrating that whole sand body instead of just
4 the ore zone, instead of being open to multiple
5 horizons in that ore zone for other screened, other
6 sand units that are not being mined.

7 JUDGE COLE: You're talking about a
8 production well?

9 MR. SAXTON: No, just the perimeter ring
10 wells.

11 JUDGE COLE: That's different from the
12 well you were just describing.

13 JUDGE WHITE: The UCL, as established from
14 the perimeter monitor wells, will be established from
15 water that's essentially an average of all of the
16 water the OZ aquifer?

17 MR. SAXTON: Yes.

18 JUDGE COLE: Okay, thank you.

19 CHAIRMAN BOLLWERK: Anything further? All
20 right. Then at this point we will go ahead and
21 dismiss this panel. And if there is -- I think we may
22 be seeing you again a little later this afternoon, so
23 stick around. But for right now, you're finished.

24 I think we're ready for the joint
25 intervenors' witness on Contention 1. While that's

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1 happening, while he's coming up, maybe you want to
2 talk a second about tomorrow morning, whatever
3 thoughts you all have?

4 MR. PUGSLEY: Your Honor, we've all
5 conferred and we certainly wouldn't mind starting at
6 8:30.

7 CHAIRMAN BOLLWERK: 8:30, okay. We were
8 going to for 8, but if you want 8:30, that's fine. We
9 will plan on 8:30 then. And then you said, they need
10 to know by mid-morning, we're talking --

11 MR. PUGSLEY: I would say early afternoon
12 would probably be --

13 CHAIRMAN BOLLWERK: I think we'll have a
14 good sense, if we're pretty well done with Contention
15 2 tomorrow morning, we're probably in pretty good
16 shape. If Contention 2 is going over into the
17 afternoon, then we're probably not in pretty good
18 shape to finish tomorrow. So we should have a good
19 sense of what's going on by the middle of the
20 afternoon tomorrow.

21 MR. PUGSLEY: Thank you, Your Honor.

22 CHAIRMAN BOLLWERK: Sure. All right.

23 MR. CRYSTAL: Your Honor, one point of
24 clarification.

25 CHAIRMAN BOLLWERK: Sure.

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1 MR. CRYSTAL: On Contention 1 which we're
2 about to start with regard to the joint intervenors'
3 exhibits, we have marked the testimony of Dr. Larson
4 as being for all contentions. We discussed with other
5 counsel here today and we have no objection to this
6 and we think it's simpler. His testimony is really
7 only on Contentions 2 and 3.

8 CHAIRMAN BOLLWERK: That's what I thought.

9 MR. CRYSTAL: So if it requires a revised
10 exhibit list, we're happy to do it.

11 CHAIRMAN BOLLWERK: No. I've already kind
12 of taken that into account. I sort of figured that
13 was the case.

14 MR. CRYSTAL: So Exhibits 4, Exhibits 5A-
15 R, B-R, and Exhibit 52-R all relate to Dr. Larson's
16 testimony.

17 CHAIRMAN BOLLWERK: I'm sorry, can you
18 give me those numbers one more time?

19 MR. CRYSTAL: JTI004, JTI005 --

20 CHAIRMAN BOLLWERK: These are all
21 Contention 2 and 3?

22 MR. CRYSTAL: Yes. And 5 has subparts,
23 JTI052-R.

24 CHAIRMAN BOLLWERK: That's Contention 2 as
25 well, right?

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1 MR. CRYSTAL: Yes.

2 CHAIRMAN BOLLWERK: Any others that are --

3 MR. CRYSTAL: Yes, 003-R. Thank you.

4 CHAIRMAN BOLLWERK: And that's Contention

5 2. So Contention 3, joint intervenors' Contention 3,

6 000-R, Contention 4 and Contention 5A-4 and B-R.

7 MR. CRYSTAL: Right, and 52.

8 CHAIRMAN BOLLWERK: And 52. Thank you.

9 Is that the rebuttal testimony?

10 MR. CRYSTAL: Right.

11 MR. PUGSLEY: If I may, Your Honor.

12 CHAIRMAN BOLLWERK: Yes.

13 MR. PUGSLEY: Just before we get into

14 admitting exhibits, I think we had discussed that JTI-

15 001-R and 002 instead of all contentions were 1 and 3,

16 correct?

17 MR. CRYSTAL: That's correct as well.

18 CHAIRMAN BOLLWERK: Great. Let me just

19 mark this a second here.

20 J U D G E W H I T E :

21 Dr. Abitz, is that the correct

22 pronunciation?

23 DR. ABITZ: Abitz like rabbits.

24 JUDGE WHITE: Oh, Dr. Abitz, excellent.

25 CHAIRMAN BOLLWERK: Would you mind moving

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1 one chair over and the only reason I ask that is so
2 that we can both see each other a little bit better.

3 DR. ABITZ: I'm a little further from the
4 monitor. I won't be able to see the monitor. That's
5 why I'm here so I can see the monitor.

6 CHAIRMAN BOLLWERK: Whatever is best for
7 you is perfectly fine.

8 DR. ABITZ: It's a matter of being close
9 enough so I can --

10 CHAIRMAN BOLLWERK: It's not critical and
11 I was just thinking it's always easier to talk with
12 someone --

13 DR. ABITZ: If I can't see the monitor, I
14 can move up to it?

15 CHAIRMAN BOLLWERK: Can you see the screen
16 over there? Because whatever goes on the monitor goes
17 on the screen, too.

18 DR. ABITZ: The big one is a little
19 difficult to see.

20 CHAIRMAN BOLLWERK: All right, if there's
21 a problem, let us know, we'll just let you move
22 closer.

23 DR. ABITZ: We'll start here.

24 CHAIRMAN BOLLWERK: All right. So at this
25 point, Dr. Abitz --

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1 DR. ABITZ: Correct.

2 CHAIRMAN BOLLWERK: Why don't you go ahead
3 and raise your right hand, if you would, please and I
4 need an affirmative oral response. I need an oral
5 response to the following question. Do you swear or
6 affirm that the testimony you will give in this
7 proceeding will be the truth, the whole truth and
8 nothing but the truth?

9 DR. ABITZ: I do.

10 CHAIRMAN BOLLWERK: And then with respect
11 to the pre-filed direct testimony that is marked as --
12 that is submitted as JTI001-R and also the rebuttal
13 testimony has been submitted as JTI051.

14 Let me ask you another question. Was this
15 testimony prepared by you or under your supervision
16 and direction and is it true and correct to the best
17 of your knowledge and belief?

18 DR. ABITZ: It was.

19 CHAIRMAN BOLLWERK: Thank you. At this
20 point then, let's go ahead and deal with the exhibits
21 for Dr. Abitz that deal with -- we'll do both
22 contentions, some of them are going to be 3, some of
23 them will be 1, but there are no objections to those
24 in terms of any issues, so we'll just go ahead and
25 admit them all now. They're jointly implicated. And

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1 again, the important part is that JTI005A and 5B-R are
2 not implicated right now. We'll deal with that
3 tomorrow when we deal with Contention 2. Is everybody
4 on the same page? Great.

5 Then briefly, we're now going to mark for
6 identification JTI001-R which is the Testimony of
7 Richard Abitz.

8 JTI002 which is the Statement of
9 Professional Qualifications of Richard Abitz, dated
10 August 25, 2014.

11 JTI006 which is an EPA, 2009, Statistical
12 Analysis of Groundwater Monitoring Data at RCRA
13 Facilities.

14 JTI007 has been removed as a duplicate.

15 JTI008 has been removed as a duplicate.

16 JTI009 which is an article by Professor
17 Abitz or Dr. Abitz and B. Darling, 2010.
18 Anthropogenic Induced Redox Disequilibrium in Uranium
19 Ore Zones, Geological Society of America Abstracts
20 with Programs, Volume 42.

21 JTI010, an article by multiple authors
22 from 2008, Hydrogeochemical evaluation and modeling
23 performed within the Swedish site investigation
24 programme from Applied Geochemistry, Volume 23, No. 7.

25 JTI011, an article by multiple authors,

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1 USGS Water-Resources Investigations Report 96-4233,
2 "Guidelines and Standard Procedures for Studies of
3 Ground-Water Quality: Selection and Installation of
4 Wells and Supporting Documentation," Reston, Virginia,
5 1997.

6 JTI012, Brooks, D.G., the author, 1988,
7 Eh-pH Diagrams for Geochemistry, published by
8 Springer-Verlag of New York.

9 JTI013, an article by multiple authors
10 from 2007, Visual Sample Plan, Version 5.0, User's
11 Guide, PNNL-16939, Pacific Northwest National
12 Laboratory, Richland, Washington.

13 JTI014, a U.S. Department of Energy
14 Fernald Field Office article, Characterization of
15 Background Water Quality for Streams and Groundwater,
16 May 1994.

17 JTI015, UEC publication, Goliad Project
18 Production Area Authorization Application for
19 Production Area-1, PA-1, August 27, 2008.

20 JTI016, also by UEC, basically the same
21 document and update, however, from March 27, 2009.

22 JTI017, a Texas Water Commission, 1988,
23 Production Area Authorization for the Kingsville Dome
24 Mining Project.

25 JTI018, Texas Water Commission, 1990,

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1 Production Area Authorization 3 for Kingsville Dome
2 Mining Project.

3 JTI019, that is Table 2.7-4 from URI
4 1983c.

5 JTI020, Texas Commission on Environmental
6 Quality, 2006, Kingsville Dome Mine, Production Area
7 3.

8 JTI021, Garcia Data Sheets.

9 JTI027, United States Geological Survey,
10 Docket 2013, Groundwater Depletion in the United
11 States, 1900-2008).

12 JTI028, again a USGS document from 1998,
13 Strategic Directions for U.S. Geological Survey
14 Groundwater Resources Program.

15 Skipping ahead again, JTI047, USGS
16 document, "What is Groundwater"? Open-File Report 93-
17 643, reprinted from April 2001.

18 JTI048, by Blanc, et al., "Modeling U.S.
19 water resources under climate change."

20 JTI049, it's an article, Drought-Stricken
21 Texas Town Turns to Toilets for Water, by Shelley
22 Kofler, May 6, 2014.

23 JTI050, Gillette Regional Water Supply
24 Project, website accessed August 25, 2014.

25 JTI051-R, this is the pre-filed Rebuttal

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1 Testimony of Dr. Richard Abitz.

2 And I believe that is it. Did I miss
3 anything.

4 MR. PUGSLEY: Your Honor, I just wanted to
5 clarify that the JTI051-R is amended from all
6 contentions to 1 and 3.

7 CHAIRMAN BOLLWERK: 1 and 3, okay. And
8 again because there's not going to be any objection to
9 it, we're going to admit it right now and then it will
10 be evidence when we talk about Contention 3. JTI051-
11 R.

12 MR. PUGSLEY: Yes.

13 CHAIRMAN BOLLWERK: All right, so all
14 those pre-filed exhibits as I have identified are now
15 marked for identification.

16 (Whereupon, the above-referred to
17 documents were marked as JTI001-R,
18 JTI002, JTI006, JTI009, JTI010, JTI011,
19 JTI012, JTI013, JTI014, JTI015, JTI016,
20 JTI017, JTI018, JTI019, JTI020, JTI021,
21 JTI027, JTI028, JTI047, JTI048, JTI049,
22 JTI050, JTI051-R for identification.)

23 Let's go ahead and admit them into the
24 record. Any objections? Hearing none, all right,
25 here we go one more time. JTI001-R, JTI002, JTI004,

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1 JTI006 --

2 MR. PUGSLEY: Your Honor, you mentioned
3 JTI004.

4 CHAIRMAN BOLLWERK: Oh, I'm sorry. I'm
5 sorry. That is not correct. That is Mr. Larson's
6 professional qualifications. Strike that. Thank you.

7 So after JTI002, we skip to JTI006, then
8 JTI009, JTI010, JTI011, JTI012, JTI013, JTI014,
9 JTI015, JTI016, JTI017, JTI018, JTI019, JTI020,
10 JTI021.

11 Moving forward, JTI028. Did I miss that
12 one before? Do we have that one marked for
13 identification, I believe? That's the USGS survey.
14 Also, JTI027 and JTI028.

15 And then skipping forward again, JTI047,
16 JTI048, JTI049, JTI050, JTI051-R and I believe that's
17 it. Those are all admitted into evidence.

18 (Whereupon, the above-referred to
19 documents were received into evidence as
20 JTI001-R, JTI002, JTI006, JTI009, JTI010,
21 JTI011, JTI012, JTI013, JTI014, JTI015,
22 JTI016, JTI017, JTI018, JTI019, JTI020,
23 JTI021, JTI027, JTI028, JTI047, JTI048,
24 JTI049, JTI050, JTI051-R.)

25 At this point, I think we have some

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1 questions. I need to take a drink of water, I'm
2 sorry.

3 JUDGE WHITE: Dr. Abitz, I'll let you know
4 where we're going. I want to ask your opinion
5 specifically about the pre-operational background for
6 excursion monitoring to be established from the
7 perimeter well ring. Then, of course, needless to say
8 we're going to get involved in the screening interval
9 issue and then also talk a little bit about the effect
10 of drilling on the potential biasing of water to set
11 baseline for restoration.

12 As we all understand that all of these can
13 bleed over into issues that are best dealt with in our
14 discussion of Contention 2 and Contention 3, so I'd
15 really like to try and focus just on these background
16 issues.

17 You've read a lot about the documents, I'm
18 sure, with regards to the proposed method for
19 establishing background for excursion monitoring using
20 the constructed perimeter monitoring wells, using what
21 are sampled from the perimeter monitoring well.
22 Foregoing a lot of the issues about whether this is
23 best done before the license or after the license,
24 foregoing issues about how effective monitoring is
25 going to be or what is going to be monitored, simply

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1 the construction of those wells and the plan to
2 collect samples for monitoring, do you have any issues
3 with regards to that plan? In other words, if that
4 plan were carried out correctly, is there a problem in
5 the basic plan of sampling from the monitor wells to
6 establish excursion monitoring baseline?

7 DR. ABITZ: I'm going to answer that in
8 parts to make sure I understand where you're going
9 with this. First part of the answer would be we're
10 assuming the monitor well ring. The perimeter wells
11 are screened through the entire ore zone thickness.

12 JUDGE WHITE: I believe we have just heard
13 that that is going to be the case.

14 DR. ABITZ: And we also have heard that
15 the monitor well ring circles the wellfield of
16 interest. Therefore before mining, there are wells,
17 perimeter monitor wells upgradient, downgradient and
18 lateral. And since then the monitor well ring
19 completely surrounds the ore zone. Some of those
20 monitor wells may intersect the ore zone as it trends
21 through the monitor well ring.

22 So if you establish baseline using all
23 those wells, using the drilling and construction
24 methods that they're presently using, there will be
25 oxidation of the ore zone and those samples could bias

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1 the results to high values that would result in large
2 upper control limits for excursion.

3 JUDGE WHITE: Okay. Those values that
4 would be biased, am I correct in assuming that they
5 would be uranium and radium 226?

6 DR. ABITZ: And other redox sensitive
7 elements such as arsenic, molybdenum, selenium.

8 JUDGE WHITE: Now I know that we'll be
9 talking about the issue of monitoring indicators for
10 lexiviant and I think we heard today that -- I've
11 forgotten what it is. Is it sulfate? I'm sorry. You
12 understand where I'm going with this. The plan is to
13 monitor those constituents.

14 We can talk with regards to later
15 Contention 2 about whether that's an effective way to
16 monitor, but would construction of the wells affect
17 baseline concentrations for those lexiviant
18 indicators?

19 DR. ABITZ: I believe you're referring to
20 the proposed monitoring parameters of chloride
21 alkalinity and I guess electrical conductivity, and
22 then with the exception of sulfate, I believe, in the
23 deeper monitoring zone?

24 JUDGE WHITE: I believe those are the ones
25 that are described in the documents.

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1 DR. ABITZ: Again, I would not expect to
2 see much variation in those parameters because they're
3 not redox sensitive.

4 JUDGE WHITE: All right, so the
5 construction of the perimeter monitoring wells,
6 assuming the efficacy of that program of monitoring
7 for lixiviant indicators, you don't see a critical
8 problem if we agree that that's what they're going to
9 do? In other words, if you agree that that's their
10 plan, you don't think it's a faulty plan, given the
11 fact that they plan to monitor primarily lixiviant
12 indicators and not uranium or radium as excursion
13 indicators?

14 As I said, we can talk about whether
15 that's valid or not.

16 DR. ABITZ: I believe there still is a
17 problem with it in that an UCL is established for
18 every parameter on their list, so if the event there
19 is an excursion, then they may need to go and look at
20 other elements and if those elements aren't properly
21 determined, for example, the redox sensitive elements,
22 then they would possibly conclude that there is no
23 problem with uranium or radium or indeed there is a
24 problem. So I still think there is a problem with the
25 way that is handled.

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1 JUDGE WHITE: Let's move on to this issue
2 of the screening interval and these, of course, we're
3 talking now about sampling within the wellfield and
4 these are samples that would be used to establish so-
5 called CAB that would be used to set baseline or
6 benchmarks for post-mining restoration.

7 You've heard justification for collecting
8 samples through a narrow interval and one of those
9 justifications was that fluvial sediments which are
10 the host for the uranium mineralization have very
11 strong vertical anisotropy which greatly inhibits the
12 vertical movement of water within the aquifer. Do you
13 agree that there would be very little vertical
14 exchange of waters within the OZ aquifer itself?

15 DR. ABITZ: I do not believe that over the
16 period of two or three years of ISL mining there would
17 be little communication between the vertical layers
18 and the ore zone. I believe that you will see through
19 diffusion and advection the entire ore zone horizon
20 contaminated by mining fluids.

21 JUDGE WHITE: So are you saying that the
22 groundwaters themselves don't have to physically
23 transfer these chemical components, but the chemical
24 components may, in fact, move or diffuse, in other
25 words, the transport of these elements as not reliant

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1 on the physical movement of the water vertically. Is
2 that what that means?

3 DR. ABITZ: Both. There's advection which
4 is the movement of the water. And then there's the
5 diffusion. And when they're pumping and extracting
6 water, I believe they will move water throughout that
7 entire interval. The exempted aquifer is not just the
8 ore horizon. It's the entire interval of the ore zone
9 sand. That is the exempted aquifer and it would not
10 be exempted if it was not going to be impacted.

11 JUDGE WHITE: Are you aware of any studies
12 that have shown in similar types of sediments that
13 there's significant vertical movement of mineral
14 variant lixiviant beyond the ore zone?

15 DR. ABITZ: Well, we know based on the
16 excursion history at ISL sites that indeed the mining
17 fluids do extend and go beyond the monitor well ring.
18 And since the monitor well ring is screened through
19 the entire sand thickness, we know that entire
20 thickness is impacted.

21 JUDGE WHITE: In your opinion what
22 thickness of screening interval within the OZ aquifer
23 by wells that are collecting water to establish CAB
24 would be appropriate?

25 DR. ABITZ: I believe that will vary from

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1 place to place because of the thickness of the ore
2 zone sand is not constant across the area. It varies.
3 So the thickness would be determined by their boring
4 logs that show the thickness of that horizon.

5 JUDGE WHITE: Am I correct that within the
6 entire -- am I correct, first of all, the OZ aquifer,
7 I believe, has an average thickness of about 150 feet.
8 Is that about right?

9 DR. ABITZ: That sounds approximately
10 correct.

11 JUDGE WHITE: Within that there are -- is
12 that from the reading there, shale horizons that are
13 sort of a good deal less permeable than the sand
14 horizons. What sort of thickness within the ore zone
15 bearing sands would be reasonable to constrain this
16 movement that you've already described by advection
17 and by diffusion? And again, I know that you wouldn't
18 have an exact number, but would it have to be the
19 entire 150 feet thickness or are we talking about 20
20 feet on each side of the ore bearing horizon or do you
21 have any idea?

22 DR. ABITZ: Again, it goes back to the
23 exempted aquifer being the entire thickness of the ore
24 zone sand. Therefore, you need to collect a
25 representative sample from that entire thickness and

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1 you could do that with a single stream through that
2 thickness or from multiple intervals through that
3 thickness.

4 JUDGE WHITE: Finally, with regards to
5 this issue, are you aware of any feasible engineering
6 solutions to the problems raised by Mr. Knode with
7 regards to sampling a wider interval through the OZ
8 aquifer and then being able to recover that well for
9 mining purposes without causing undue issues? Or
10 would you simply have to drill a separate well for
11 sampling and then abandon it for any use as a mining
12 well?

13 DR. ABITZ: I believe you would just have
14 a separate well for monitoring. That's correct.

15 JUDGE WHITE: Okay. That's all I have on
16 the screening issue.

17 Judge Cole, do you have anything on this
18 for Dr. Abitz?

19 JUDGE COLE: Yes, just a couple of
20 questions. With respect to the problem of advection
21 and diffusion. The operating system, they maintain a
22 hydraulic gradient between the input and the exit to
23 try to control the flow through that area. If this is
24 properly operated, shouldn't this minimize the problem
25 of advection and diffusion and would the lixiviant

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1 that enters into this area pass over to be collected
2 and rather than diffusing and moving elsewhere, would
3 this control it? Would this minimize the problem that
4 you're talking about?

5 DR. ABITZ: The hydraulics of operating a
6 wellfield are very difficult to discuss here because
7 of the complexity of the stratigraphy. I don't think
8 a simple model captures accurately what happens in a
9 complex fluvial aquifer. I do not know all the
10 assumptions they made in their model, but I'm guessing
11 it's a fairly simple model with the exclusion of all
12 the clay layers and silt layers in the sand zone that
13 could affect the transport. So the model is saying
14 they can control the fluids. And what's really
15 happening are probably two different things. And I
16 don't believe there's any way you can keep the entire
17 sand horizon from becoming contaminated from mining
18 fluids.

19 JUDGE COLE: If you had a hydraulic
20 gradient that can halt the movement of the fluid by
21 virtue of it being there, it's going to move high
22 elevation to low elevation in the hydraulic grade line
23 and wouldn't that tend to maintain fluid in that flow
24 system and minimize the problems that you're talking
25 about if the system is properly operating?

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1 DR. ABITZ: Under ideal conditions,
2 perhaps, but there's never that situation. Over two
3 or three years of operation, wells are shut down for
4 maintenance. They could have problems where they shut
5 them down, so it's not a 24/7 throughout the entire
6 production period. So I don't think there's any way
7 you can stop the fluids from moving through the entire
8 sand thickness.

9 JUDGE COLE: Thank you.

10 JUDGE WHITE: I'd like to move on to the
11 effective wellfield construction on groundwater
12 quality used for restoration background -- for
13 establishing restoration background.

14 In some of the testimony that you've
15 written, there's been discussion about how
16 construction of the entire wellfield will bias
17 baseline water quality analyses owing to the
18 introduction of oxygen into the aquifer. We've heard
19 today that the wells that will be drilled to sample
20 water to be used to establish CAB will be drilled
21 prior to the wells that are to be used for both
22 introduction of lixiviant and withdraw of pregnant
23 fluids. In your opinion, first will that help
24 minimize the issue that you've raised because in
25 effect, the entire wellfield won't be constructed

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1 prior to the collection of these samples. And
2 secondly, will it minimize it enough to alleviate your
3 concerns?

4 DR. ABITZ: Stepping back a bit, the
5 number of exploration bore holes that have been placed
6 in the wellfield prior to the monitor well ring is
7 sizable, hundreds. So there is quite a bit of
8 disturbance prior to even putting the monitor well
9 ring in. The monitor well ring before the wellfield
10 is good, but there still has been disturbance of the
11 aquifer prior to putting the monitor well ring in.
12 And the monitor well ring itself will no doubt cross
13 over the ore trend and there will be monitor wells
14 that will disturb the ore zone when those are placed
15 and developed.

16 JUDGE WHITE: And then I take it that
17 drilling the wells, even if drilling -- also drilling
18 the wells that are to be used within the wellfield for
19 sampling water to establish CAB which is in the
20 wellfield itself and I'm talking about the perimeter
21 monitoring wells, I guess if I can paraphrase your
22 answer that yes, collecting those samples prior to
23 construction of the entire wellfield can reduce that
24 problem, but it's certainly not going to eliminate it.
25 Is that what you're saying?

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1 DR. ABITZ: That's correct. And again,
2 we're talking about a sample from a well. We're
3 talking about impacts to the ore zone where that well
4 was placed. Certainly, the impacts do not extend to
5 the entire aquifer like we have heard earlier. We're
6 talking about samples taken from a well and that
7 sample being impacted.

8 JUDGE WHITE: So how big an area around
9 the bottom of that well do you think is going to be
10 impacted with this oxidation effect?

11 DR. ABITZ: I don't believe that's a
12 question that's easy to answer. You have mechanical
13 disturbance where you're grinding the ore into a finer
14 surface area and we don't have particle size analysis
15 to show what the surface is before and after. And
16 also, I don't believe we have any mass balance on the
17 amount of oxygen that was delivered down into the ore
18 zone. So without that information it's very difficult
19 to say.

20 JUDGE WHITE: We've read in rebuttal
21 testimony that the level of groundwater plays a role
22 in how effective the drilling is in oxidizing the
23 water at the ore site. And it's asserted that if the
24 groundwater level is well above the ore zone, the
25 effect is minimized. Can you comment on that?

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1 DR. ABITZ: I cannot comment on it because
2 I don't fully understand the mechanism behind that
3 argument.

4 JUDGE WHITE: There's another argument
5 that's related to that, that talks about the mechanism
6 of air injection and asserts that the air injection
7 mechanism actually takes place well above the ore zone
8 and not within the ore zone itself and for that reason
9 introduction of oxygen from the air injection is
10 essentially negligible in the ore zone. Do you have
11 any comment on that?

12 DR. ABITZ: I don't believe that's the
13 case because regardless of whether it's directly in
14 the ore zone or not, bubbling air through a column of
15 water oxygen will diffuse through that water.

16 JUDGE WHITE: Would it diffuse a hundred
17 feet downward through that water still?

18 DR. ABITZ: That will depend on the
19 pressure of injection and the temperature and how long
20 it takes place. So without those parameters, it's
21 difficult to say.

22 JUDGE WHITE: The drilling will be
23 assisted by -- it will be using mud drillings, so it
24 will be assisted by the use of bentonite muds. Is
25 there any issue that you're aware of for this

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1 oxidation situation that can arise from the use of
2 bentonite muds as a drilling medium?

3 DR. ABITZ: Well, generally they use
4 oxygenated water along with the drilling muds and that
5 will deliver a source of oxygen ten to the orders of
6 magnitude higher than what is present in reducing the
7 environment with uraninite ore deposits.

8 JUDGE WHITE: So am I correct that the
9 bentonite is simply a ground mineral that's carried as
10 a slurry within water that's collected at the surface?

11 DR. ABITZ: Correct.

12 JUDGE WHITE: And injected downward. And
13 you're saying that the oxygen content of that water
14 that's the medium carrying the ground bentonite will
15 be introducing oxygen?

16 DR. ABITZ: Correct.

17 JUDGE WHITE: I see. Judge Cole, do you
18 have any questions about this issue for Dr. Abitz?

19 JUDGE COLE: No, not at this time.

20 JUDGE WHITE: That concludes my questions.

21 JUDGE COLE: I have some additional
22 questions for Dr. Abitz.

23 CHAIRMAN BOLLWERK: Why don't you go
24 ahead, Judge Cole, and then we may come back to a
25 different subject for a couple of minutes.

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1 JUDGE COLE: Okay. Dr. Abitz, do you
2 acknowledge that in its review of Strata's application
3 for compliance with the Atomic Energy Act and the NRC
4 safety regulation, the staff found that the empirical
5 data on groundwater quality collected by Strata was
6 consistent with the guidance in Section 2.7 of NUREG
7 1569 Standard Review Plan for in situ enriched uranium
8 extraction license application?

9 MR. FETTUS: Your Honor, Judge Cole and
10 Judge Bollwerk, that question calls for a legal
11 conclusion.

12 MS. ANDERSON: It also calls for
13 testifying to the opinion of the other party.

14 CHAIRMAN BOLLWERK: I'm sorry?

15 MS. ANDERSON: It calls for testifying to
16 the opinion of the other party. It's not Dr. Abitz'
17 opinion.

18 MR. PUGSLEY: We would disagree with that
19 conclusion first that it calls for a legal conclusion.
20 Non-lawyers follow NRC guidance. They don't require
21 legal opinions to follow NRC guidance so this is --
22 sounds like a question that's based on -- would be
23 asking -- based on Dr. Abitz' experience.

24 JUDGE COLE: But he's read all the
25 documents. He knows what the applicant and what the

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1 staff found. I assume he's read the documents. Does
2 he agree that that's what they stated?

3 CHAIRMAN BOLLWERK: So all you're asking,
4 Judge Cole, is it his understanding this is what the
5 staff did?

6 JUDGE COLE: Yes. The applicant and what
7 the staff found.

8 CHAIRMAN BOLLWERK: Basically, can you
9 answer the question?

10 DR. ABITZ: I'll answer it in this form.
11 The guidance is the guidance. I believe criterion 7
12 states that complete baseline information will be
13 collected and reported. Complete baseline information
14 means a quantitative analysis of baseline conditions
15 prior to disturbance of the aquifer. So what the
16 guidance says and what the criterion 7 says may be
17 different things, but I do not believe complete
18 baseline information was collected or reported.

19 CHAIRMAN BOLLWERK: All right.

20 JUDGE COLE: Does the staff believe that
21 it was done?

22 DR. ABITZ: I'm sorry, Dr. Cole, I didn't
23 understand that.

24 CHAIRMAN BOLLWERK: The question was do
25 you believe the staff believes that it has complied

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1 with all the appropriate guidance and regulations?

2 DR. ABITZ: It doesn't matter what I
3 belief about the staff. I can just tell you what I
4 believe is right.

5 CHAIRMAN BOLLWERK: All right.

6 CHAIRMAN BOLLWERK: Any other questions,
7 Judge Cole?

8 JUDGE COLE: Let me look at this list a
9 minute. Do you acknowledge that Strata's NRC license
10 and named conditions included condition N.6, 11.3 and
11 11.4 requiring Strata to provide additional data
12 relative to determining groundwater quality and
13 groundwater restoration standards?

14 DR. ABITZ: Again, I'm not sure I
15 understand the direction of the question, Dr. Cole.

16 JUDGE COLE: Well, the license contains
17 conditions telling Strata what they have to do, what
18 they have to provide. Are you familiar with those
19 requirements?

20 DR. ABITZ: I'm familiar with the
21 requirement that says complete baseline information
22 needs to be reported and I do not believe that has
23 been done.

24 JUDGE COLE: All right, sir, I understand
25 your position.

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1 JUDGE WHITE: I have one other question
2 that you can clear up for me. In your prefiled
3 written testimony, you refer to RCRA and CERCLA sites
4 and I must admit I'm not terribly familiar with these,
5 looking them up on Wikipedia.

6 CHAIRMAN BOLLWERK: If you read it there,
7 it must be true.

8 JUDGE WHITE: Yes, that's why I mentioned
9 that just to make sure you know the source of my
10 knowledge. Some of these sites, I'm not sure which
11 are what are popularly known as Superfund sites, is
12 that correct?

13 DR. ABITZ: Yes, CERCLA sites, yes.

14 JUDGE WHITE: My understanding of these
15 places, these are places that have been very badly
16 impacted by earlier industrial activities, mining or
17 many of them are mining, but some of them are other
18 kinds of things. And so it might be assumed that the
19 groundwater at these sites is badly degraded. And so
20 it's still not clear to me how collecting background
21 for cleaning up a site that has already been badly
22 degraded relates to collecting background for a site
23 at which the industrial activity has yet to take
24 place, if you follow me.

25 DR. ABITZ: I do.

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1 JUDGE WHITE: Can you clarify that for me?

2 DR. ABITZ: Absolutely. I think there's
3 confusion about that. It's not RCRA or CERCLA or
4 mining or ISL. That has nothing really to do with
5 those specific regulatory programs. Baseline or
6 background is just that. There's really a proper way
7 to do it. It's the natural condition prior to
8 disturbance and the proper scientific and statistical
9 methods apply across the board the same way. There's
10 a right way to do it and it doesn't matter if you're
11 doing it for RCRA. It doesn't matter if you're doing
12 it for CERCLA. It doesn't matter if you're doing it
13 for ISL uranium mining. It's the same fundamental
14 principles, scientific and statistically, apply. So
15 it was just to give an example of what other rigor is
16 backed by more science and statistics at RCRA and
17 CERCLA sites relative to the ISL industry.

18 JUDGE WHITE: I see. Thank you.

19 CHAIRMAN BOLLWERK: That's all your
20 questions.

21 Judge Cole, did you have anything else?

22 JUDGE COLE: No.

23 CHAIRMAN BOLLWERK: All right. Then at
24 this point, I do have some questions, but again, I'm
25 going to defer them to the additional panel I think

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1 we're going to have at the end. At this point, if you
2 want to take about a 15-minute break and think about
3 any cross examination questions you might have that
4 you would propose the Board ask. It's about 5 'til 4,
5 so we'll say 4:10, that's 15 minutes, I believe.

6 (Whereupon, the above-entitled matter went
7 off the record at 3:56 p.m. and resumed at 4:11 p.m.)

8 CHAIRMAN BOLLWERK: All right. We've
9 received some proposed cross-examination questions.
10 The Board is now going to recess briefly to go and
11 read those and discuss them with Judge Cole. We
12 should be back hopefully in 15 minutes.

13 Just to let you know what the next step
14 will be, we will obviously talk with Dr. Abitz about
15 any of the questions that we are going to ask.

16 The plan will be to have all the parties'
17 witnesses take the witness stand at one time. We have
18 a series of questions that we'd like to ask with
19 everyone seated, the idea being we will direct a
20 question to one of the parties' witnesses and that
21 party can respond. Then the other party will have an
22 opportunity to respond to the answer that they've
23 heard.

24 So that's the protocol we'll do after we
25 ask any further cross-examination questions for Dr.

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1 Abitz.

2 All right. Let's go ahead and take our
3 recess. We'll be back in hopefully no more than 15
4 minutes.

5 (Whereupon, the above-entitled matter went
6 off the record at 4:12 p.m. and resumed at 4:27 p.m.)

7 CHAIRMAN BOLLWERK: All right. We're back
8 after a break for the Board to look at and consider
9 the questions proposed by the parties for cross-
10 examination. We do have several to ask Dr. Abitz.

11 Let me mention just as a heads up that in
12 terms of the panel that we're going to be putting
13 together after Dr. Abitz, most of the questions are
14 going to relate to the prefiled testimony -- I'm
15 sorry, the rebuttal prefiled testimony that was filed
16 by the parties.

17 So to the degree that you want to pull
18 those documents up, that's kind of what the focus of
19 it will be in terms of the questions that will be
20 asked. Perhaps not exclusively but probably most of
21 them.

22 Let me just check. Dr. Cole, are you
23 still there?

24 JUDGE COLE: Still here.

25 CHAIRMAN BOLLWERK: All right. Very good.

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1 First question, Dr. Abitz. Could you
2 please explain in more detail how one establishes pre-
3 disturbance ground water quality at a contaminated
4 CERCLA or RCRA cleanup site?

5 Is there anything differently you would do
6 to establish a scientifically defensible baseline for
7 an ISL site?

8 DR. ABITZ: I'll answer the last part
9 first and answer that as no. A baseline or background
10 is just that. It's the same regardless of what type
11 of regulatory environment you're in.

12 CHAIRMAN BOLLWERK: Okay.

13 DR. ABITZ: The way I would go about that
14 and the way that pretty much the most scientific and
15 statistically valid methods have been well
16 established, you need to delineate that area of
17 concern. For an ISL operation it would be the
18 exempted aquifer. That would be the area of concern,
19 whatever area that is.

20 You would put a grid over it and randomly
21 locate well locations. You would place wells at those
22 random selected spots.

23 In the case of uranium mining, you have
24 the special case where you have redox-sensitive areas.
25 So the common drilling techniques won't work there

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1 because you'll disturb the ore zone. If you don't
2 have the uranium ore body then you can use the common
3 drilling techniques.

4 You develop your wells. And then you
5 collect samples, representative samples from a
6 properly screened horizon through the thickness of the
7 sand. Or you have multiple intervals through the
8 thickness.

9 You would need to collect at least
10 generally a couple of years worth to make sure you can
11 distinguish seasonal fluctuations. Collecting four
12 samples over eight weeks does not give you seasonal
13 fluctuation. It should be quarterly for a couple of
14 years.

15 Then you would apply proper statistical
16 protocols to evaluate the distribution of the data and
17 determine what statistical methods you can use to come
18 up to measuring the central tendency of the
19 parameters.

20 CHAIRMAN BOLLWERK: All right. Just as a
21 question, mostly RCRA and CERCLA sites are obviously
22 ones where there's a lot of environmental issues
23 there. Do you really need to wait two years?

24 I mean, at lot of times they would like to
25 start -- once they get the money they like to start

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1 cleaning them up. Is that an issue?

2 DR. ABITZ: No, it's not.

3 CHAIRMAN BOLLWERK: Like we're on the
4 front side of an ISL proceeding but they're on the
5 back side. They've got a different issue.

6 DR. ABITZ: Generally contamination has
7 been at those sites for years if not decades. So a
8 couple more years to establish baseline is not a big
9 deal, especially because of most of those baseline
10 wells will be upgradient?

11 CHAIRMAN BOLLWERK: All right. Any other
12 questions from the Board on that one?

13 All right. Second question. Are the
14 concerns you raised regarding the approved methods
15 that Strata will conduct to determine the CAB and
16 UCLs, are those concerns that are unique to the Ross
17 project or are these concerns that you have with the
18 ISR industry and the NRC's licensing process in
19 general?

20 DR. ABITZ: I would need to know what you
21 mean by concerns.

22 CHAIRMAN BOLLWERK: You've raised concerns
23 about the methods of drilling, where the wells are
24 being placed, how long they're being monitored, some
25 of the things you just said about the CERLCA site.

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1 I guess the question that's being asked
2 is, are these unique to Ross or is this something that
3 you'd be concerned about if you were at Powertech or
4 you were at Pickwater, any ISR site?

5 DR. ABITZ: Okay. I think the concerns
6 are valid everywhere, that you follow proper
7 scientific and statistical protocols.

8 I believe the ISR industry has the
9 additional burden of drilling into an ore zone that
10 becomes oxidized using standard drilling and well
11 development techniques. So you have an added burden
12 of trying to determine what the true baseline is when
13 they drill through an ore zone. You don't see that at
14 other sites because you don't have that condition.

15 CHAIRMAN BOLLWERK: But in terms of this
16 industry, it is in your view something that's across
17 the industry?

18 DR. ABITZ: It is, yes.

19 CHAIRMAN BOLLWERK: A couple of other
20 questions. What do you think the rate of diffusion
21 might be relative to advection, that's A-D-V-E-C-T-I-
22 O-N, to transport the chemicals in the aquifer?

23 DR. ABITZ: I think that question is not
24 possible to answer without more data.

25 CHAIRMAN BOLLWERK: All right. Is it or

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1 isn't it true that bentonite mud forms a film that is
2 measured in 1/30th of an inch, an extremely narrow
3 zone?

4 DR. ABITZ: I don't understand where the
5 question is going. I don't know how to answer that.

6 CHAIRMAN BOLLWERK: Okay. Can you help at
7 all? No? Okay.

8 The next question. What is the source,
9 and I believe by the word source they mean regulation
10 guidance, for defining complete baseline as a
11 statistically derived value?

12 DR. ABITZ: Complete baseline is a
13 quantitative thing. It has to be because it's a
14 natural state that exists prior to disturbing an
15 aquifer.

16 The only way you can do that is by
17 quantitative analysis. How complete is quantitative
18 by nature?

19 CHAIRMAN BOLLWERK: All right.

20 JUDGE WHITE: Would you -- is there -- I'm
21 not sure if we're looking for a documentary source,
22 meaning I'm not sure what that question is getting at.

23 But our interpretation was it was getting
24 at, is there a set of regulations or a set of
25 protocols with your CERCLA example, then reference a

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1 set of protocols that is memorialized in regulation or
2 in guidance for those sites that you would like to see
3 and applied to ISL sites?

4 DR. ABITZ: Yes. I believe I cited that
5 as one of my references. It would be the EPA Unified
6 Guidance on Groundwater Monitoring.

7 JUDGE WHITE: Okay. I'm not sure what
8 they were asking. But if they were asking for that,
9 then good.

10 CHAIRMAN BOLLWERK: The last question.
11 What do you calculate as the ground flow velocity and
12 how will drilling the well field wells affect the
13 perimeter monitoring ring 400 feet away under pre-
14 operational conditions?

15 DR. ABITZ: That's not a question I can
16 answer on the spot. I'd have to go back and look at
17 what data would be needed for that type of calculation
18 and perform it outside of this spontaneous arena here.

19 CHAIRMAN BOLLWERK: All right. Judge
20 Cole, anything that you have?

21 JUDGE COLE: No.

22 CHAIRMAN BOLLWERK: All right. Then that
23 concludes the Court's cross-examination of Dr. Abitz
24 on his own.

25 If you'll stay there however, we're going

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1 to bring up some other witnesses.

2 Basically what we'd like to have is all
3 the witnesses before both SEI and the staff that were
4 in panel and sworn in for Contention 1 to come forward
5 and take a seat at the table. Make yourselves
6 comfortable wherever that might be in the first or
7 second row.

8 What I'm going to do is ask a question.
9 I'll indicate which panel it's intended -- it's
10 directed at. Whichever member that panel feels is
11 appropriate can answer it.

12 Then once we've gotten the answer from the
13 person who -- the panel whom the question is directed,
14 then any of the other folks that are there from the
15 other parties should feel to respond to the response
16 they've heard. If nobody has anything to say then
17 that will be the end of it.

18 We're hoping actually to give you all an
19 opportunity to sort of discuss the issue being raised
20 by the questions.

21 Again, I would indicate that these are
22 ones that have come from the rebuttal testimony that
23 was filed by the party. At this point we really don't
24 have the sort of interaction that we -- we have
25 prefiled testimony and then rebuttal testimony. We

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1 want the parties to have an opportunity to interact.

2 One thing I would do is to remind you all
3 the microphones are very directional. There is a
4 number of them there. If there is not one in front of
5 you, please feel free to share with someone or just
6 pull the mic over. But you do need to have the mic in
7 front of your mouth if there is a response you want to
8 make.

9 Once we face with the initial panel's
10 response I will ask do any of the witnesses for the
11 other parties have anything to say. You'll indicate
12 by raising your hand or whatever. We'll try to call
13 on everybody and make sure everybody that has
14 something to say gets an opportunity.

15 Again, if the folks from the original
16 panel have something further that they want to say
17 based on the answers they heard, we'll sort of
18 continue until we have kind of played the thing out.

19 Any questions about what we're going to
20 do? I don't think it's complicated. Hopefully
21 everyone lets everybody say their piece. It will be
22 organized and not turned into sort of a free-for-all.

23 Okay. The first question is for the SEI
24 panel.

25 In his response to Question 15 of his

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1 rebuttal testimony, Dr. Abitz asserts relative to Mr.
2 Knode's rebuttal testimony regarding bias that the ISL
3 industry has not been able to provide any evidence to
4 support the position that natural attenuation will
5 return groundwater to baseline conditions in 20 to 30
6 years.

7 I'd like to know what SEI has to say about
8 that statement.

9 MR. KNODE: Yes. First of all, as long as
10 30 years ago NUREG-3136 discussed natural attenuation
11 using core from iso deposited in South Texas. So to
12 think that this is something that's new or has not
13 been considered in decades is surprising to me.

14 Additionally, if you'd look at NRC037
15 there's a peer reviewed document. Just reading one of
16 the lead-ins to it, relatively low concentrations of
17 key species such as uranium observed in monitoring
18 wells outside the mined area indicate that natural
19 attenuation likely plays an important role in
20 controlling mobility of redox-sensitive contaminants.

21 As was mentioned in our opening testimony
22 -- excuse me, our position statement by our legal
23 counsel, there are several EPA documents that discuss
24 modern natural attenuation of inorganic contaminants
25 in groundwater. Those include things like radium,

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1 radon, uranium.

2 So these are -- natural attenuation is
3 everywhere in literature.

4 CHAIRMAN BOLLWERK: All right. Are you
5 finished for this point?

6 MR. KNODE: For now.

7 CHAIRMAN BOLLWERK: Okay. Let me ask
8 either the staff or Dr. Abitz if there's anything
9 they'd like to say in response to that?

10 MS. MOORE: Could you repeat the question?

11 CHAIRMAN BOLLWERK: Sure. The question
12 basically was, in his rebuttal testimony Dr. Abitz
13 asserted relative to the SEI rebuttal testimony
14 regarding bias that the ISL industry had not been able
15 to provide any evidence to support the position that
16 natural attenuation will return groundwater to
17 baseline conditions in 20 to 30 years.

18 I think we just heard SEI explain why they
19 thought that wasn't the case, that there was support
20 for that.

21 MS. MOORE: I do have something to add,
22 Your Honor.

23 CHAIRMAN BOLLWERK: Okay.

24 MS. MOORE: I would just like to note that
25 the final SEIS allows for the fact that groundwater

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1 may not be restored to baseline. And it discusses the
2 fact that criteria in 5(b)5 allows for restoration to
3 baseline to the constituent concentrations in Table
4 5(c) and also in ACL.

5 We base our conclusion and the SEIS on the
6 applicant or the licensee being able to meet any of
7 those criteria.

8 CHAIRMAN BOLLWERK: All right. Anyone
9 else from the staff want to say anything?

10 Yes, please.

11 DR. JOHNSON: Yes, Judge Bollwerk. I'd
12 like to just add my concurrence to the documents that
13 were cited by SEI on natural attenuation.

14 I'd just like to highlight just a bit on
15 the EPA document that recently was published on
16 natural attenuation on radionuclides. They go into
17 quite a level of detail on those mechanisms of natural
18 attenuation for uranium as well as other radionuclides
19 and provide a long list of references to that end.
20 Not just from the uranium mining and milling end, ISR
21 operations, but also uranium in other settings.

22 So the record is pretty deep in terms of
23 examples of how natural attenuation for uranium works
24 in the environment.

25 MR. FETTUS: Your Honor, could we have the

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1 site to the NRC exhibit on the EPA document that
2 you're referencing?

3 MR. HARPER: It's not in the list.

4 MR. FETTUS: Oh, it's not on the exhibit
5 list?

6 MR. HARPER: We can add that exhibit at
7 the end of the hearing, Your Honor.

8 CHAIRMAN BOLLWERK: Sure. If there's
9 something we need to supplement the record with, we
10 certainly can.

11 MR. HARPER: We'll do that by this
12 evening.

13 MR. FETTUS: This is not a document that
14 we've reviewed or seen before.

15 MR. HARPER: We don't have the document
16 with us, Your Honor. We can provide it to the parties
17 this evening. That is unfortunately the best we can
18 do.

19 CHAIRMAN BOLLWERK: Yes. Let's go ahead
20 and maybe you can get a copy of it.

21 You want to take a look at it obviously?

22 MR. FETTUS: Yes.

23 CHAIRMAN BOLLWERK: We'll decide tomorrow
24 if it's something we need to admit or not.

25 MR. FETTUS: Thank you, Your Honor.

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1 And actually if you could provide it with
2 specifically what you'd like us to look at so we don't
3 have to look at --

4 MR. HARPER: Right. Absolutely.

5 CHAIRMAN BOLLWERK: A page reference or
6 whatever that would be. That would be terrific.

7 If we do decide to go ahead with its
8 admission, we'll probably need to have it filed.
9 Let's go ahead and just circulate it and decide
10 whether we even need to put it into the record.

11 All right. Anyone else?

12 Dr. Abitz, this was your question. I
13 certainly want to offer you the opportunity. You
14 don't have to say anything if you don't want to. It's
15 not required. But if you'd like to, this would be --

16 DR. ABITZ: I'll briefly respond. I don't
17 believe there is evidence that I've seen. Perhaps
18 there is in this document that they'll provide.

19 But generally, once a site has been
20 reacclimated to alternate concentration levels there
21 is no monitoring required. So I'd be very interested
22 to know what the levels are for uranium in ISL sites
23 that have been reacclimated to alternate concentration
24 levels. Because I believe monitoring stops then and
25 there is no long-term monitoring.

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1 So if there's long-term monitoring beyond
2 sign-off of reclamation by the NRC, I'd love to see
3 the data.

4 CHAIRMAN BOLLWERK: Okay. Yes?

5 DR. JOHNSON: Judge Bollwerk, I'd like to
6 say that the reference, I think it was 047, NRC047,
7 the Borch document, that's exactly what that is. That
8 restoration was approved in that well field.

9 And then the requirement -- and I believe
10 the requirement came from the state of Wyoming. But
11 the requirement was for extended monitoring. They
12 selected -- certain wells were selected for that
13 monitoring.

14 That document prepared by Borch and others
15 is an interpretation of the data that were collected
16 over, I believe it was seven years, maybe five but in
17 that area. It's those data collected after
18 reclamation was approved or restoration was approved
19 that formed the basis of the conclusion that natural
20 attenuation was operating.

21 JUDGE WHITE: Excuse me, Dr. Johnson.
22 That's NRC037, that's what you were just referring to?

23 DR. JOHNSON: Yes. Excuse me, 037 not
24 047, my mistake.

25 CHAIRMAN BOLLWERK: Are you familiar with

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1 that document, Dr. Abitz?

2 DR. ABITZ: I am not. I can't say off the
3 top of my head. I will look at it.

4 CHAIRMAN BOLLWERK: All right. Anything
5 anyone wants to say further on that particular
6 question?

7 MR. LAWRENCE: I have an observation I'd
8 like to make.

9 CHAIRMAN BOLLWERK: Yes.

10 MR. LAWRENCE: Dr. Abitz contends that the
11 active drilling with oxygen tends to increase uranium
12 locally at the well or change the uranium
13 concentrations in the aquifer.

14 But that that impact has shown to subside
15 over time, doesn't that imply that there's some type
16 of attenuation going on if that contention is correct?

17 It seems like he has to believe that there
18 must be attenuation when the conditions change from
19 oxidized to reducing.

20 DR. ABITZ: I do believe that there is
21 reduction if there is a mild disturbance.

22 But what we're talking about here is
23 attenuation after years and years of ISL mining where
24 you have oxygenated lixiviant moving through the sand
25 formations and you've really destroyed the redox

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1 conditions. So it's two completely different
2 situations we're talking about.

3 CHAIRMAN BOLLWERK: All right.

4 DR. JOHNSON: Judge Bollwerk?

5 CHAIRMAN BOLLWERK: Surely. I'm sorry?
6 Go ahead if you're ready.

7 DR. JOHNSON: I would just like to add one
8 thing. Natural attenuation of uranium occurs by two
9 mechanisms, two primary mechanisms.

10 One of them of course is the one that
11 we've been talking about most. That is the reduction
12 from the soluble uranium-plus-six to the insoluble
13 uranium-plus-four.

14 But in oxidized areas it can also be
15 attenuated by absorption on iron hydroxide. And that
16 mechanism is discussed by EPA in this document that we
17 will show you as well as some of the other reports,
18 the documents that have been -- I believe some of them
19 are the Intervener's exhibits.

20 But it's a mechanism that has been studied
21 more and more recently about an alternative way for
22 attenuation to occur in the oxidized areas.

23 DR. ABITZ: I agree with what, I believe
24 it's Dr. Johnson, stated.

25 But the part that's missing from that

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1 story is over the period of mining you have passed
2 very high concentrations of uranium over the iron
3 oxyhydroxide surfaces. And those sites become filled.

4 Once that happens they lose their capacity
5 to absorb further. So there is a limit to what can go
6 on iron oxyhydroxide. No one has demonstrated whether
7 there's further capacity after ISL mining has
8 occurred.

9 So it can occur. But they reach capacity
10 and at that point they're no longer useful.

11 CHAIRMAN BOLLWERK: All right. Anything
12 further on this subject from anyone?

13 MR. SCHIFFER: This is Ben Schiffer. I'd
14 like to bring this a little bit closer to home.

15 I understand that this project has
16 benefited from the Nubeth Research and Development
17 Project which operated well over 30 years ago and was
18 documented to have been restored. The license was
19 terminated.

20 We have in fact been able to go back and
21 measure the concentrations of radionuclides and other
22 parameters from the original five-spot pattern.

23 The results that we see today indicates
24 that the concentration of these parameters are easily
25 at or below the concentrations that they were when the

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1 baseline occurred back in the 70's. So I think for
2 all of us that's a very good example of long-term
3 monitoring of a site.

4 Those data are in the license application
5 and acknowledged well in the FCIs that NRC staff put
6 together.

7 DR. ABITZ: I would comment on two things
8 there.

9 First, the Nubeth project was a very short
10 duration. It was not several years. I believe it was
11 less than a year, maybe several months.

12 Second, the baseline values that were
13 determined at Nubeth were not proper baseline values.
14 They were biased to high values. So therefore there
15 was no proper baseline established to compare
16 restoration values to.

17 CHAIRMAN BOLLWERK: All right. Anything
18 further from anyone?

19 All right. Thank you very much.

20 Do either Judge Cole or Judge White have
21 any questions?

22 JUDGE WHITE: No questions from me.

23 JUDGE COLE: No.

24 CHAIRMAN BOLLWERK: Since the issue at
25 Nubeth has come up, let me pose this question. This

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1 is for the staff to respond to initially.

2 I'd like to know what your response is to
3 Dr. Abitz's response to Rebuttal Question 12, that the
4 staff had provided no response to his direct testimony
5 that the impacts of mining at the former Nubeth site
6 are clearly visible in the uranium versus radium 226
7 plot to groundwater samples that was provided in his
8 direct testimony.

9 DR. JOHNSON: Judge Bollwerk?

10 CHAIRMAN BOLLWERK: Yes?

11 DR. JOHNSON: I'll begin. That whole
12 argument, that plot and the associated argument, makes
13 the assumption that there is a consistent and direct
14 relationship between uranium and radium in the
15 groundwater. That is just simply not the case.

16 If you look at any data set where you have
17 both uranium and radium, and there are some examples
18 that we can talk about if you'd like, there's not a
19 consistent relationship. Radium doesn't follow
20 uranium in the way that that argument about that ratio
21 requires.

22 So it just strikes me that there's just no
23 substance to that argument, using that ratio to try to
24 establish that there is some residual from Nubeth.
25 And we can go on about that.

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1 But the concentrations of radium were very
2 high in the baseline data that was collected for
3 Nubeth. They were just really high. And the uranium
4 was high. It's roughly in the range that it's in
5 today.

6 So the reason the ratios don't work is
7 because for some reason the radium concentrations and
8 those Nubeth wells were very high compared to the
9 uranium. And it's a very different situation today.
10 That radium was there before any mining took place.

11 So it just doesn't seem to -- it just
12 strikes me that the fundamental premise that that
13 argument is based upon that uranium and radium -- that
14 radium follows uranium in this predictable, consistent
15 way just isn't accurate.

16 DR. ABITZ: I believe there is a
17 misunderstanding on this plot. This plot is showing
18 two things.

19 If Dr. Johnson believes I'm saying radium
20 follows uranium then I must have been very poor in the
21 way I stated it. Let me clear it up here.

22 Radium does not move like uranium. The
23 point being made here is where you disturb an ore
24 horizon, uranium and radium will both be present at
25 elevated concentrations because when you oxidize the

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1 ore you release radium.

2 But since uranium moves and radium does
3 not move far from where it's oxidized, the uranium
4 concentrations will increase downgradient but radium
5 will not.

6 That's what's being shown here. You can
7 see the areas impacted by the lixiviant. Where
8 oxidation occurred you have uranium and radium high.
9 Where radium transported out of the area you just have
10 uranium at high values with low radium values. So
11 that's what's being shown here.

12 CHAIRMAN BOLLWERK: All right.

13 DR. JOHNSON: Perhaps when I use the word
14 move, I didn't mean physically move. What I meant is
15 that my understanding in this plot means that when
16 uranium is released there's always a predictable,
17 constant proportion of radium that follows that. Not
18 follows physically but is also released.

19 That's just simply not the case. When you
20 look at the initial water sampling from a multitude of
21 these wells, look at -- the Nubeth wells were put in
22 in 1977 and 1978 before mining occurred.

23 You look at the radium -- uranium-radium
24 ratio and then you look at the ones today. It's not
25 the uranium that has changed in any significant way.

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1 It's the radium. And the radium was higher. And this
2 was pre the R&D so it's pre-mining of any sort for
3 Nubeth.

4 So that ratio is not constant even before
5 any ISR activity.

6 DR. ABITZ: Again, I don't understand the
7 ratio. It's not to do with the ratio.

8 It's simply that radium and uranium will
9 be elevated where the ore is oxidized. Where the ore
10 is not oxidized uranium will be transported
11 downgradient and you will see high uranium without
12 radium.

13 So I'm not certain I understand what Dr.
14 Johnson is getting at with the ratio.

15 CHAIRMAN BOLLWERK: Judge White, did you
16 have something you wanted to say?

17 JUDGE WHITE: No.

18 CHAIRMAN BOLLWERK: No? All right.

19 Any further response on that question?

20 Yes?

21 MS. MOORE: I would just like to add that
22 the affected environment presented in the EIS is the
23 environment that existed just prior to Strata
24 admitting its license application. That's the
25 affected environment that we are trying to predict the

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1 impact to.

2 In the cumulative impact section, that's
3 where we take into account any past historical
4 cumulative impacts that may have come from Nubeth or
5 any future projects that may also impact those same
6 resources.

7 CHAIRMAN BOLLWERK: All right. Anything
8 further from anyone on that statement?

9 Let me ask one other question with respect
10 to radium 226. This is for the staff to respond to.

11 What I'll mention is your response to Dr.
12 Abitz's response to Rebuttal Question 10 regarding the
13 lack of short-term changes with respect to radium 226
14 levels in samples from the six cluster wells.

15 If you need to take a look at his rebuttal
16 testimony, feel free. I tried to make these questions
17 sort of -- I was trying to be efficient. But maybe I
18 was too cryptic in some instances.

19 Do you need to look at the prefilled
20 testimony? You got it?

21 MS. MOORE: What page is that?

22 CHAIRMAN BOLLWERK: It's going to be
23 Question 10 of the -- it's Rebuttal Question 10.

24 MR. FETTUS: Pages 8 and 9 of Dr. Abitz's
25 rebuttal testimony.

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1 CHAIRMAN BOLLWERK: Which is, I don't
2 remember the number. Hold on one second and I'll tell
3 you.

4 MR. PUGSLEY: 051-R.

5 CHAIRMAN BOLLWERK: It's JTI 51. I'm
6 sorry. It's Question 10.

7 Can you reduce it to 75 maybe? Yes.
8 There we go. Get to the right place and then we can
9 blow it back up again. I think you need to go down a
10 little further. There it is.

11 Does she need to scroll up a little bit?

12 DR. JOHNSON: I understand the question.

13 CHAIRMAN BOLLWERK: You understand the
14 question?

15 DR. JOHNSON: Yes.

16 CHAIRMAN BOLLWERK: Okay.

17 DR. JOHNSON: I believe the question is
18 that the staff did not respond properly to the
19 depiction of the data, uranium data from the
20 monitoring well clusters to show that over time -- the
21 assertion is that over time four of the six wells, the
22 concentrations decline from the very beginning of that
23 two-year period to the end.

24 Is that correct? Yes? Okay.

25 The assertion is that those declines in

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1 four of the six wells illustrate that they were more
2 -- the oxidation perturbed the wells at the beginning.
3 And then as the oxygen was consumed they slowly
4 declined over time. That's the assertion.

5 Now, my interpretation of that is that the
6 data is the data. And indeed one well, I think you
7 could argue that it's so close to background or
8 undetectable that it may not really show a decline.
9 But certainly some show somewhat of a little decline.

10 But the part of that that I don't believe
11 to be the case is that that illustrates the concern
12 about introduction of oxygen, increased uranium, and
13 then over time slowly decrease.

14 And I would say this because first of all,
15 the one well that should be impacted the greatest by
16 the introduction of oxygen and if that happened, and
17 leading to an increase or spike in the uranium, was
18 the one that has the highest concentrations of
19 uranium.

20 But indeed in that well concentrations
21 actually increased over time. Just a little bit but
22 it certainly did not show a decline. So that pattern
23 did not exist in that particular well.

24 Which, I would think that if indeed the
25 premise about the introduction of oxygen leading to

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1 this biased tie of uranium were valid, you would see
2 it in that well. And you don't.

3 Secondly, in terms of utilizing that data
4 in the job that were to do, which is the environmental
5 impact statement, we looked at a range per the
6 guidance for NEPA. We looked at the range of
7 concentrations that existed in the site
8 characterization, the prelicense site
9 characterization, the maximum and the minimum.

10 For those constituents that had no or very
11 few, less than detectable values, we calculated mean.
12 The parameters of course that had a lot of less than
13 detectable values, calculating mean isn't a very
14 practical, useful exercise.

15 So how we used that data in the
16 supplemental environmental impact statement was just
17 simply to characterize and describe the groundwater of
18 that resource in the area that could be impacted. So
19 certainly using the maximum and minimum was sufficient
20 for that.

21 Now, from the beginning of the eight
22 quarters to the end of the eight quarters, that range,
23 that maximum to minimum really didn't change
24 appreciatively. So there wasn't any systematic change
25 in that range either down or up over that time.

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1 So those data were sufficient for our
2 purposes. And to dive deep into some of these nuances
3 of why the concentrations in some wells, not all wells
4 but in some wells, were changing slightly over time
5 was just really not relevant to preparation of the
6 supplemental environmental impact statement.

7 DR. ABITZ: I think this goes to the
8 fundamental issue on our differing professional
9 opinions on what complete baseline is. I don't concur
10 with Dr. Johnson's argument.

11 I think it's clearly visible on the plot
12 that the ranges of max and min are different for the
13 2010 and 2011 data, with the exception perhaps of the
14 14180Z well.

15 Also, we noted in my testimony that there
16 is very clear evidence at the Goliad site in Texas
17 that there was a decrease in uranium concentrations
18 about a year after they put the wells in. So this is
19 not something that happens at one spot.

20 And the purpose here would be to improve
21 the collection of data to see what happens with these
22 uranium values with time prior to any mining taking
23 place.

24 CHAIRMAN BOLLWERK: Anything further you
25 want to say, Dr. Johnson?

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1 DR. JOHNSON: Just quickly.

2 CHAIRMAN BOLLWERK: Surely.

3 DR. JOHNSON: I'm not seeing it right now.
4 But in our prefiled testimony there is one answer
5 which actually looks at the ranges and how the range
6 maximum to minimum changed from the beginning to the
7 end of the eight quarters.

8 So that is established in our testimony.
9 And indeed there was no systematic change to that.

10 CHAIRMAN BOLLWERK: All right.

11 DR. JOHNSON: It's A.1.10.

12 MS. ANDERSON: Your Honor, is that a
13 rebuttal or trial?

14 DR. JOHNSON: I believe it's direct.

15 CHAIRMAN BOLLWERK: Let's see. The direct
16 testimony would have been --

17 MR. PUGSLEY: NRC001.

18 CHAIRMAN BOLLWERK: NRC001? All right.
19 Do we know what page approximately?

20 DR. JOHNSON: It's actually A.1.8, Section
21 2.

22 MR. PUGSLEY: It's going to be 001 and it
23 looks like 19, Your Honor.

24 CHAIRMAN BOLLWERK: Okay. That would be
25 the easiest way to find it.

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1 DR. JOHNSON: That may have been a
2 mistake. Let me just see if I can --

3 CHAIRMAN BOLLWERK: That's A.1.8.

4 DR. JOHNSON: I'm not finding what I had
5 hoped to find here.

6 MR. PUGSLEY: Are we looking for A.1.8,
7 Section 2?

8 DR. JOHNSON: Well, that's what I thought.
9 But I'm not seeing --

10 MR. PUGSLEY: Section 1. That's 18, page
11 18.

12 DR. JOHNSON: Actually it's on page 18.

13 CHAIRMAN BOLLWERK: Okay.

14 DR. JOHNSON: And it's actually on A.1.8,
15 Section 1. It's on page 18.

16 The uranium concentrations in the first
17 quarter from the ore zone aquifers with monitoring
18 wells range from 0.011, this is milligrams per liter,
19 0.011 to 0.096.

20 At the close of their eight quarters of
21 sampling it was 0.006 to 0.104.

22 So the range actually increased slightly
23 on both ends between the beginning to the end of the
24 eight quarters.

25 DR. ABITZ: So that's as a range for all

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1 wells?

2 DR. JOHNSON: For the supplemental
3 environmental impact statement we were to describe the
4 resource that would be impacted. And the description
5 included the range of particular constituents that
6 were found in that resource.

7 So the range, yes. This is the range of
8 uranium that was found in the groundwater that
9 potentially would be impacted.

10 DR. ABITZ: For all wells, not well by
11 well? You didn't compare the ranges for well by well,
12 you compared the ranges for all wells?

13 DR. JOHNSON: That's right.

14 DR. ABITZ: Okay.

15 DR. JOHNSON: Because the objective was to
16 understand, to characterize that resource. So all of
17 the wells would be included in characterizing that
18 resource.

19 DR. ABITZ: Well, that's very different
20 than my point. My point is that things change for
21 each well on a well by well basis. Some of these
22 wells are changing.

23 I'm not comparing the entire range of all
24 wells. I'm comparing the ranges of each well
25 independently to show the change. We're talking two

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1 different things here.

2 DR. JOHNSON: Yes. My perspective is that
3 was required by NEPA for the supplemental
4 environmental impact statement.

5 CHAIRMAN BOLLWERK: All right. Anything
6 else on this particular point?

7 The next point I'd like to go to very
8 briefly is rebuttal questions -- this is again for the
9 staff. Rebuttal Questions 4 and 8, which Dr. Abitz
10 makes several points.

11 Basically he has explained to us just over
12 the last 15-20 minutes about his views about proper
13 statistical methods. In these questions he kind of
14 again makes those points and also endorses the EPA
15 Unified Guidance on Groundwater Monitoring.

16 I'm just sort of wondering as a general
17 matter from the staff, is there something wrong with
18 doing it the way for instance EPA does? Is there
19 something that's inconsistent with what the agency is
20 trying to accomplish? Is it something that's contrary
21 to its health and safety mission?

22 What is the problem with what Professor
23 Abitz is suggesting in terms of coming up with better,
24 more effective methods of finding out this groundwater
25 data?

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1 It's a fairly broad -- to some degree I
2 want to say it's a policy question. But he's making
3 a very broad point.

4 I guess the question is, if there is a
5 better way to do it why aren't we doing it? Or isn't
6 this a better way and why isn't it? Maybe that's the
7 question.

8 DR. JOHNSON: Maybe I could just start by
9 saying why what we had, the data that was provided was
10 sufficient for the purposes of the supplemental
11 environmental impact statement. And then perhaps Mr.
12 Saxton or Ms. Moore want to comment on the broader
13 question.

14 CHAIRMAN BOLLWERK: I recognize the EPA
15 unified guidance is different.

16 The question is, why isn't it applicable
17 here other than it's different?

18 The NRC tries to use best practices I
19 think. So if this isn't the best practice, why isn't
20 it?

21 MR. SAXTON: Can you repeat the question?
22 For the pre-license site characterization data?

23 CHAIRMAN BOLLWERK: Basically what we're
24 trying to accomplish here, which is to find out what
25 the best way is to find out what the baseline is.

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1 MR. SAXTON: The baseline not being the
2 criteria 5(b)5 baseline, it's the pre-license site
3 characterization?

4 CHAIRMAN BOLLWERK: Dr. Abitz has a point
5 that what you're trying to do, whether you define it
6 as baseline or -- his point is that the agency seems
7 to be, I don't want to say arbitrary. But they're
8 dividing this into two parts. And his point seems to
9 be it's really only one part, you just need to do it
10 the right way.

11 Am I putting words in your mouth?

12 DR. ABITZ: That's correct. You're
13 correct.

14 CHAIRMAN BOLLWERK: He's pointed to the
15 EPA guidance and he's pointed to other places where it
16 seemed to support his view.

17 The question is, why don't these fit the
18 NRC's model other than we have some regulations which
19 may or may not be read that way?

20 If this is a best practice, why aren't we
21 doing it? I guess that's the question.

22 And if it isn't, it must not be for some
23 reason so what is that?

24 DR. JOHNSON: I think that part of the
25 answer to that is to look at the purpose of why we're

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1 collecting certain data.

2 For the purposes of NEPA and in the SEIS,
3 the important feature was to describe the resource, in
4 other words characterize the resource that could
5 potentially be impacted. And then have sufficient
6 data to characterize the impacts.

7 Embedded in that was not a purpose to
8 establish remediation goals or restoration targets.
9 That's not part of the requirement of NEPA and the
10 environmental impact statement.

11 So the EPA unified guidance and others,
12 the purpose of that often times is more focused toward
13 establishing the remediation goals or restoration
14 targets or what have you. But that's different than
15 the purpose and the requirements that NEPA has for the
16 environmental impact statement.

17 CHAIRMAN BOLLWERK: Okay.

18 MR. SAXTON: As far as the pre-license
19 site characterization, our goal is just to verify the
20 Applicant's conceptual model.

21 Basically they're taking the Lance
22 Formation aquifer, subdividing it into what they
23 characterize as the ozone -- the OZ aquifer, the DM
24 aquifer. Because we discussed it obviously we
25 understand what their conceptual model is.

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1 And then they get their quality data and
2 we evaluate what that is as far as the distribution.
3 That will lay the basis for when they go through the
4 well field and they actually get the groundwater
5 protection standards.

6 Now, we don't do unbiased group sampling
7 because the well field itself is -- it should be
8 pretty close to the uranium ore body. Our goal is to
9 get representative wells that are going to be impacted
10 by the operations and characterize the data before
11 mining or milling operations. Then once the operation
12 is done, use those same wells to determine the
13 restoration success.

14 So the goal isn't to get an unbiased
15 evaluation that the MCO is above a certain level.
16 That's not the purpose of groundwater protection
17 standards. The groundwater protection standards are
18 just finding what it is prior to the operations.

19 CHAIRMAN BOLLWERK: All right. Staff, I
20 see you back there in the back. Someone from NCI
21 wants to respond as well and then I guess we'll hear
22 from Dr. Abitz if he has anything further to say. Go
23 ahead.

24 MS. MOORE: I just wanted to add to what
25 Dr. Johnson said regarding the purposes for the data.

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1 In the NEPS review what we're doing is
2 trying to determine or predict potential impacts.
3 That's different than when you're actually assessing
4 actual environmental impacts after some impacts have
5 taken place and after operations have occurred.

6 It's that stage where you want to make
7 sure that you have the specific data to compare the
8 specific data that you have after operations. We are
9 simply predicting potential impacts.

10 There's a difference as far as the type of
11 data that you need at that stage. That's why the
12 regulations clarify those two different types of data
13 and why there's a difference between how you calculate
14 those two types of data for those two different
15 purposes.

16 I think sometimes when we say determine
17 environmental impacts, sometimes they're talking about
18 actual environmental impacts and sometimes they're
19 talking about predicting potential impacts. We need
20 to be clear on what we're saying because there is a
21 difference between what data you need to do those two
22 different analyses.

23 CHAIRMAN BOLLWERK: Okay. Thank you.

24 The gentleman from NCI wants to -- no?
25 You grabbed the microphone but you changed your mind?

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1 MR. DEMUTH: Judge Bollwerk, just if I
2 could add to that. NRC staff and SEI both have
3 clearly delineated in their testimony that licensing
4 of an ISR facility is a phased process. As Mr. Saxon
5 just iterated, it is process where you have different
6 stages of data gathering and different objectives.

7 So at this stage of the process the data
8 objectives were driven by the licensing process. And
9 those are evaluated in the SER by NRC staff to
10 determine whether the process can be safely conducted.

11 It is the NRC guidance NUREG-1569, Reg
12 Guide 4.14 among others that drives that process,
13 including the data collection and also discussions,
14 meetings, guidance from NRC staff.

15 It would be inappropriate to take a CERCLA
16 process and tell NRC staff that that's what Strata
17 would use for a licensing process in the same way it
18 would be inappropriate to go to a CERCLA site and tell
19 EPA that we were going to use an NRC process as the
20 guidance for data collection.

21 In addition, the CERCLA process that Dr.
22 Abitz has referred to, it's a compliance process.
23 It's not a permit process. So we're really comparing
24 apples and oranges.

25 I think the key thing here is what stage

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1 of the process are we at. NRC guidance and staff have
2 directed SEI to collect certain kinds of data and
3 demonstrate that it is sufficient for the purposes
4 that's been evaluated by NRC staff, including their
5 statisticians, and determined to be adequate.

6 CHAIRMAN BOLLWERK: All right. Anything
7 further that staff wants to say? If not, I'm going to
8 turn to Dr. Abitz.

9 DR. JOHNSON: Can I just add one thing,
10 Judge Bollwerk?

11 CHAIRMAN BOLLWERK: Yes.

12 DR. JOHNSON: The other thing I believe
13 he's mentioning is that this is a supplemental
14 environmental impact statement, which means of course
15 that it is tiered from the generic environmental
16 impact statement.

17 The major criteria for doing the tiering
18 is to determine and establish that this project fits
19 within the overall characterization with the geology
20 and the groundwater quality and so on that were
21 evaluated in the GEIS, the generic environmental
22 impact statement.

23 So that's another purpose of this initial
24 review of the prelicense site characterization, to
25 establish that it is consistent or comparable with

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1 that evaluated in the generic impact statement.

2 And for that purpose the type of
3 statistical evaluation that EPA uses, for example, to
4 come up with remediation goals is simply not
5 necessary.

6 CHAIRMAN BOLLWERK: Dr. Abitz, if you would
7 like to say anything we're obviously here to listen.

8 DR. ABITZ: Yes. Thank you, Your Honor.
9 I believe this gets back to the fundamental
10 professional opinion problem we've been having here
11 today.

12 Baseline and background are baseline and
13 background. CERCLA, RCRA, or ISL, it does not matter.
14 CERCLA or RCRA was just given as an example where
15 robust scientific and statistical methods are used and
16 proven to establish what the natural, undisturbed
17 conditions in an aquifer are.

18 I read Appendix A criteria in 7 and 5(b).
19 There is no discussion of two different backgrounds or
20 baselines there. They say complete baseline
21 information. To me that's a full-blown quantitative
22 analysis with proper scientific and statistical
23 protocols.

24 So I believe we're getting wrapped around
25 the axle on something that doesn't need to be this

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1 complicated. Baseline is baseline and it should be
2 done properly at any site. It doesn't matter what
3 regulations govern it.

4 CHAIRMAN BOLLWERK: All right. Judge
5 White, anything you would like to add?

6 JUDGE WHITE: Yes. Again, I don't want to
7 dwell too long on this CERCLA versus ISL situation.
8 And I know that you're just using that as an example.

9 But at CERCLA again what you're trying to
10 determine is what the water quality was like before it
11 was damaged. So you have to really go outside the
12 damaged area.

13 Is that correct?

14 DR. ABITZ: Again, baseline is baseline.
15 Wherever you are there's a natural condition. It
16 doesn't matter if the site's been disturbed or not
17 because you're not going to do the natural condition
18 at the disturbed area. You're going to go outside of
19 it, like it you say.

20 JUDGE WHITE: That's true. But at an ISL
21 site you have the natural condition at the epicenter
22 of where the activity is going to take place. In
23 other words, the activity hasn't taken place so you're
24 sampling waters from the actual place where the
25 activity is likely to create a disturbance.

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1 Isn't that kind of a fundamental
2 difference that is going to drive baseline
3 determinations to at least some degree to be carried
4 out differently?

5 DR. ABITZ: I do not believe so. When
6 you're talking about ISL operations you're still
7 talking about a very large area for aquifer exemption.
8 The ore is not in that entire aquifer exempted zone.

9 Therefore the baseline is the baseline.
10 You go in and you randomly select locations. You put
11 in your wells and you try to not disturb the ore
12 horizon as best you can. You have that added burden
13 with an ISL operation.

14 JUDGE WHITE: Right. I understand.

15 DR. ABITZ: It has nothing to do with
16 whether there's contamination or not because baseline
17 and background means it's in an unaffected, natural
18 occurring area.

19 JUDGE WHITE: Can I ask one other question
20 to clarify as long as everybody is here, to clarify a
21 point that really Strata folks should have been the
22 ones to clarify it but the point was in fact covered
23 by a staff witness.

24 The staff witness said in many cases if in
25 an ISL ore deposit you have stacked ore

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1 concentrations, in order to mine different levels, in
2 other words ore that is at a different stratigraphic
3 level than the initial ore you're mining, you can't
4 retrofit an existing well. You have to actually drill
5 a separate well.

6 Are stacked ores at the Ross site such
7 that Ross Strata will have to drill separate wells to
8 mine separate ore bodies at different levels within
9 the site?

10 CHAIRMAN BOLLWERK: You're looking for a
11 response from SEI?

12 JUDGE WHITE: I am. And in fact only from
13 SEI since I don't think anyone else would have that
14 information.

15 MR. SCHIFFER: Judge White, if we can, I
16 believe in TR -- in Exhibit 14C we have an exhibit
17 that clearly depicts how multiple stacked fronts would
18 be mined and ostensibly how they would be -- how the
19 water quality would be baselined.

20 If I could get maybe a clarification on
21 the exact page. I believe it's in Chapter 6. If we
22 can bring that up maybe that would help clarify this
23 matter.

24 CHAIRMAN BOLLWERK: 14C, the Applicant's
25 14C?

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1 MR. SCHIFFER: Yes. I'm sorry. Applicant
2 14C.

3 CHAIRMAN BOLLWERK: Chapter 6? Section 6
4 actually?

5 MR. SCHIFFER: Yes. That's what I meant.

6 MR. HARPER: Section 6 begins on page 271.

7 CHAIRMAN BOLLWERK: It's a pretty large
8 section.

9 MR. SCHIFFER: It's going to be a figure.

10 CHAIRMAN BOLLWERK: Are the figures listed
11 in the table of contents?

12 MR. SCHIFFER: Yes.

13 CHAIRMAN BOLLWERK: There we go. Which
14 figure is it?

15 MR. PUGSLEY: Page 263 of this exhibit
16 please.

17 CHAIRMAN BOLLWERK: Is that it?

18 MR. SCHIFFER: Yes, Judge.

19 Hopefully we can take a minute to look at
20 this. But I think what you'll see is this confirms
21 what Mr. Saxton discussed previously in the panel. It
22 really looks at how these wells and how ostensibly the
23 baseline would be established for the different front
24 systems in a stacked scenario.

25 You'll see that one set of wells would be

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1 used to establish baseline in a portion of the ore
2 zone aquifer.

3 And another set of wells would be used to
4 establish water quality baseline in another portion of
5 the ore zone aquifer, particularly in the scenario
6 where you have finer grain materials that may be of
7 lower permeability that separate those mineralized
8 areas.

9 I think this really goes to the heart of
10 this discussion.

11 JUDGE WHITE: Okay. I think that's very
12 clear. I'll reiterate it just to be sure.

13 You're saying that in fact separate wells
14 will be used for mining the different levels within
15 the stack, and also some of those wells initially will
16 be used to determine separate CABs for each level that
17 is actively mined, is that correct?

18 MR. SCHIFFER: Yes, sir.

19 JUDGE WHITE: And then when restoration
20 time comes and mining ceases, will each of these
21 levels be subject to restoration that then will try to
22 meet that CAB baseline?

23 MR. SCHIFFER: Yes, Judge.

24 JUDGE WHITE: That's clear. Thank you.
25 That clears that up.

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1 CHAIRMAN BOLLWERK: Anyone else on the
2 panel have anything they want to say on that subject?

3 All right. At this point it's about
4 almost 5:30.

5 Judge Cole, do you have anything further?

6 JUDGE COLE: Nothing for right now.

7 CHAIRMAN BOLLWERK: Then I think at this
8 point we will conclude the testimony on Contention 1.

9 I want to thank all of you for your
10 service to the Board, the information you provided
11 both in the individual panel and our larger panel
12 here. This was a very enlightening and professional
13 discussion and we appreciate all of you providing
14 information to the Board.

15 I think we'll see most of you again.
16 Again, we appreciate what you provided us today.

17 I should check on one thing. Does anybody
18 have any cross-examination questions? We sort of did
19 cross.

20 MS. MONTEITH: We have no further cross-
21 examination questions.

22 MR. PUGSLEY: None from SEI.

23 MR. FETTUS: None from the Joint
24 Intervenors.

25 CHAIRMAN BOLLWERK: Okay. Again, we

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1 appreciate very much the efforts of all of you to
2 provide the Board with information this afternoon.

3 We're now at 5:30 and I think we're going
4 to start again tomorrow morning at 8:30. That was the
5 agreement of the parties and that's when the Board
6 will be here to start up with Contention 2. At that
7 point we'll move forward and see how much we get done
8 tomorrow. That's the plan.

9 I think you all now understand the way
10 this is going to run now more or less. So hopefully
11 Contention 2 and then Contention 3 will proceed the
12 same way.

13 Do any of the parties have anything they
14 need to bring to the attention of the Board at this
15 point?

16 MR. HARPER: Just to reiterate that staff
17 will circulate that document.

18 CHAIRMAN BOLLWERK: Right. That'd be
19 good. If we do need to admit it we can do that. If
20 we don't then we're good that way as well.

21 All right. Very good. Thank you,
22 everyone. We'll see you in the morning. We stand
23 adjourned until 8:30 tomorrow morning.

24 (Whereupon, the above-entitled matter went
25 off the record at 5:30 p.m.)

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Title: Strata Energy, Inc.
 Ross In Situ Recovery Uranium Project

Docket Number: 40-9091-MLA

ASLB Number: 12-915-01-MLA-BD01

Location: Gillette, Wyoming

Date: Wednesday, October 1, 2014

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD PANEL

HEARING

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In the Matter of: : Docket No. 40-9091-MLA

STRATA ENERGY, INC. :

: ASLBP No.

(Ross In Situ Recovery : 12-915-01-MLA-BD01

Uranium Project) :

-----x

Wednesday, October 1, 2014

Wyoming Meeting Room

Energy Hall

CAMP-PLEX Multi-Event

Facilities

1635 Reata Drive

Gillette, Wyoming

BEFORE:

G. PAUL BOLLWERK, III, Chairman

DR. RICHARD F. COLE, Administrative Judge*

DR. CRAIG M. WHITE, Administrative Judge

*present via teleconference

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15
16
17
18
19
20
21
22
23
24
25

TABLE OF CONTENTS

Contention 2	481
Contention 3	652
<u>EXHIBITS</u>	<u>MARK RECD</u>
<u>NRC:</u>	
021-038, 048, 049	534 534
039-042, 050, 051	705 706
021-037, 048	
<u>SEI</u>	
035-038, 044, 049	518 519
034, 042, 048, 049	671 673
040, 041, 043	672 673
<u>JTI</u>	
004, 003-R, 004-R, 005B-R, 005R-2	581 587
005A-R, 029-035, 037-039, 052-R,	
053, 054, 055-R, 056	586 587
051-R2, 005B-R2	742 742
022-026, 036, 040-046, 057, 058	
060-062R	746 747

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

2 (8:30 a.m.)

3 CHAIRMAN BOLLWERK: All right.

4 Can we go on the record, please.

5 Good morning, everyone. We are
6 here for the second day of the Strata hearing,
7 and we are going to be just starting today
8 with Contention 2.

9 Having said that, if we have any
10 unfinished business relative to Contention 1,
11 then we should take care of that now.

12 MR. HARPER: We do, Your Honor.
13 This is Richard Harper from the NRC Staff.

14 The document that was referenced
15 by Dr. Johnson after the EPA report on natural
16 attenuation, we circulated out to the parties
17 and provided copies for -- hard copies for the
18 Board and at this time, we would request that
19 that exhibit be entered into the record.

20 CHAIRMAN BOLLWERK: All right.
21 And I take it -- have you put it into the e-
22 filing system yet?

23 MR. HARPER: I have not yet, but I
24 will do that shortly.

25 CHAIRMAN BOLLWERK: Okay. So, I -

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1 - this is a copy that we have. I guess
2 everyone has got a copy of this document here.
3 All right.

4 So, let's go ahead, and we will
5 mark it for identification at this point.
6 And, when we see, or you tell us that you put
7 it in the e-filing, then we will go ahead and
8 we will admit it into evidence.

9 MR. CRYSTAL: Your Honor.

10 CHAIRMAN BOLLWERK: Yes, sir.

11 MR. CRYSTAL: Could I raise a
12 concern about that?

13 CHAIRMAN BOLLWERK: Surely.

14 MR. CRYSTAL: As you know, we,
15 Joint Intervenors -- this is Howard Crystal
16 for the Joint Intervenors.

17 The first I have had an
18 opportunity to look at this document last
19 night. In general, just sort of concerned
20 about a document that we just looked at for
21 the first time, but we did have the
22 opportunity.

23 We have looked it over, but we
24 haven't had an opportunity to have our
25 witnesses comment on it, and you have heard

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1 some comments on it from Dr. Johnson.

2 In our view, while we -- we don't
3 object to the addition of this exhibit into
4 the record, we think it would be appropriate
5 to allow Dr. Abitz an opportunity to respond
6 to the comments that Dr. Johnson made about
7 that document, now that he has had a chance to
8 review it.

9 CHAIRMAN BOLLWERK: Right.

10 MR. CRYSTAL: And if we -- if he
11 can have that opportunity, because, otherwise,
12 I don't think we will have any opportunity to
13 get anything into the record about it.

14 Then --

15 CHAIRMAN BOLLWERK: Okay.

16 MR. CRYSTAL: -- we would have no
17 problem with it being submitted.

18 CHAIRMAN BOLLWERK: So, let me
19 turn back to staff counsel.

20 Do you have -- well, let me ask
21 anyone, do you have any objections to Dr.
22 Abitz having an opportunity to comment on the
23 document?

24 And we can certainly put Dr.
25 Johnson back on -- into the witness box as

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1 well. So --

2 MR. CRYSTAL: That would be our
3 recommendation, Your Honor. We have no
4 objections to that course of action.

5 CHAIRMAN BOLLWERK: Do you think,
6 between the two of them, we would have had
7 everybody we need, or do we need to put
8 anybody else into the -

9 MR. CRYSTAL: I believe, between
10 the two of them, that should suffice.

11 CHAIRMAN BOLLWERK: Are you
12 prepared to do that now, or would you prefer
13 to --

14 MR. CRYSTAL: We are prepared to
15 do that now.

16 CHAIRMAN BOLLWERK: All right.

17 MR. HARPER: We are, as well.

18 CHAIRMAN BOLLWERK: All right.
19 Let's do this.

20 MR. HARPER: Your Honor, we would
21 submit that we would like our witness to be
22 part of that, as well.

23 CHAIRMAN BOLLWERK: Witness --

24 MR. HARPER: Mr. Knode.

25 CHAIRMAN BOLLWERK: There were

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1 four people that --

2 MR. HARPER: Mr. Knode.

3 CHAIRMAN BOLLWERK: Mr. Knode.

4 All right.

5 Any objection to that?

6 MR. CRYSTAL: No objection.

7 MR. HARPER: No objections.

8 CHAIRMAN BOLLWERK: All right.

9 Let's go ahead, then, and take care of the --
10 while they are coming up, let me go ahead and
11 we will mark this for identification.

12 Again, we will use it, we will
13 mark it for identification. It sounds like if
14 this happens, there is not going to be
15 objection to its admission, so we will assume
16 we are going to do that, but I would like this
17 procedural matter of it being put in e-filing
18 done first.

19 All right. So, right now, we will
20 go ahead and mark for identification NRC052,
21 which is EPA Document, the Monitored Natural
22 Attenuation of inorganic contaminants in
23 groundwater, Volume 3.

24 (Whereupon, the above-referred-to
25 document was marked as NRC Exhibit No. 052 for

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1 identification.)

2 CHAIRMAN BOLLWERK: And I am just
3 trying to see if it has a date on it
4 somewhere. Hold on one second. And it is
5 dated September 2010.

6 All right. And so if the three
7 witnesses that we just mentioned, would like
8 to come up and take their place in the witness
9 box. Hopefully everybody is here.

10 All right. And will remind you
11 that all of you are -- continue to be under
12 oath.

13 Go ahead. If you need to get --
14 keep everybody hydrated here. We don't want
15 anybody with dry mouth. Everybody good? Do
16 you need another cup?

17 All right. Dr. Abitz, I think you
18 had something you wanted to say about the --
19 what has now been marked for identification as
20 NRC 052.

21 DR. ABITZ: Yes. The document
22 that Dr. Johnson cited yesterday, and noted
23 that -- the natural attenuation of uranium.

24 We had a chance to briefly look
25 through that yesterday, and there are three

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1 points I would like to make about that
2 specific document.

3 The first point is a general
4 point. Dr. Johnson cited this as a relevant
5 document for ISL mining, and I note that this
6 is a document by EPA on research and
7 development studies for CERCLA and RCRA sites
8 which, again, goes to show that science is
9 science and it applies to CERCLA, RCRA and ISL
10 mining sites.

11 The second point is the natural
12 attenuation, but in fact, many of these
13 studies show is that once uranium is in a plus
14 6 oxidation state, and complex bicarbonated
15 and moving through and moving through an
16 aquifer, it is very difficult to attenuate it
17 and remove it by reductive attenuation.

18 In other words, it is very
19 difficult to reduce this uranyl carbonate
20 species in the plus 6 state once it has been
21 oxidized.

22 So, in fact, natural attenuation
23 does not work very good once it is in a uranyl
24 carbonate species.

25 And the last point, we had

1 mentioned yesterday that, you know, control
2 with nitrogen gases with an error technique,
3 it would be very important in not oxidizing
4 the ore zone.

5 And the studies in this report
6 also show that when they try to remove uranium
7 4 species from sediment using carbonate in the
8 presence of nitrogen gas, it was not
9 successful.

10 So, nitrogen gas inhibits the
11 oxidation of uranium and keeps it in the
12 uranium 4 phase and out of solution, so those
13 three points are very important for our
14 arguments.

15 CHAIRMAN BOLLWERK: All right.
16 Anything further you need to say at this
17 point?

18 DR. ABITZ: Not at this time.
19 Thank you.

20 CHAIRMAN BOLLWERK: All right.
21 Let me then turn to the other two witnesses
22 who have been empaneled and ask if either of
23 the staff or Strata's witness have any
24 comments on what you just heard.

25 MR. KNODE: Just one comment. You

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1 know, in my testimony I made a comment that
2 there was, you know evidence that groundwater
3 will naturally attenuate and I was accused
4 that that was a blanket statement without any
5 support offered.

6 For support yesterday, we were in
7 3136, NRC Document 037, I believe it was, and
8 this document. The point being the natural
9 attenuation is well-known, been looked at for
10 years and works.

11 CHAIRMAN BOLLWERK: All right.

12 DR. JOHNSON: Judge Bollwerk, the
13 -- my -- my utilization of this document, this
14 report, is to understand the parameters that
15 control natural attenuation, and the
16 parameters are many, and they are discussed in
17 detail here, and the parameters are such, you
18 know, the oxidation stage has been mentioned,
19 the concentration of carbonate, which has been
20 mentioned, the mass of iron hydrozide, which
21 is discussed here, and pH, there is just a
22 host of parameters that affect the magnitude
23 or the degree of natural attenuation in
24 certain circumstances.

25 So, the -- the benefit, the

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1 utilization of a document such as this, which
2 compiles the studies and the empirical
3 evidence and, you know, the case examples and
4 so on, the compilation of these can really be
5 used to enhance natural attenuation in
6 situations where that is your objective.

7 So, this just -- this document
8 confirms that, indeed, it happens. There are
9 certainly different parameters that -- that
10 affect the degree of it, but those parameters
11 can be -- be controlled and adjusted to
12 accomplish the end.

13 CHAIRMAN BOLLWERK: All right.
14 Thank you.

15 Dr. Abitz, anything further you
16 want to say?

17 DR. ABITZ: Yes. Final point.
18 There is no doubt that natural attenuation can
19 be effective. What matters are the conditions
20 in the aquifer.

21 And, as we discussed yesterday,
22 under very high uranium concentrations and
23 carbonate during lixiviant injection,
24 attenuation by absorption is pretty much
25 swamped out, so it is not effective.

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1 So, I do not believe that natural
2 attenuation under the cases of lixiviant
3 migration apply to ISL mining sites.

4 CHAIRMAN BOLLWERK: All right.
5 Thank you.

6 DR. JOHNSON: Dr. Bollwerk, I
7 would like to just follow up on that.

8 You know, just imagine the
9 situation in which there is an area around a
10 -- you know, between the injection and the
11 production wells, rather a small area, that
12 has been -- there are high -- high
13 concentrations of carbonate from the ISR
14 activities.

15 But, postoperations and after
16 restoration has been approved, there is no
17 more pumping. So, the natural groundwater
18 gradient takes over and there is a flow,
19 although these sediments it is a rather -- it
20 is rather slow but, nonetheless, there is some
21 flow away from that wellfield.

22 So, once the transport begins to
23 be outside that wellfield, the carbonate
24 concentrations immediately decline because
25 that is the area that has not felt the effect

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1 of the injection of the lixiviant.

2 So, it is -- and it is that area
3 where natural attenuation is very critical
4 because it is in that area that is between the
5 wellfield, actual production with the
6 wellfield pattern and the perimeter monitoring
7 wells that mark the edge of the exemptive
8 aquifer.

9 So, it is that space, which is
10 roughly 400 feet in the case of the Ross
11 project where the natural attenuation will
12 occur because the situations are more normal.
13 They have not been impacted by lixiviant.

14 The carbonate concentrations start
15 declining, and then the conditions are such
16 that natural attenuation can occur.

17 CHAIRMAN BOLLWERK: All right.
18 Dr. Abitz.

19 DR. ABITZ: Yes. Thank you. Two
20 points on this. One, the fluids move away
21 from the injection point in that the
22 restoration of carbonate levels are lower.

23 The importance here is, one, as
24 they move away, if they are -- if Dr. Johnson
25 is assuming that there will be absorption then

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1 and attenuation because the conditions are no
2 longer oxidizing, then if that is the case,
3 there will not be iron oxyhydroxides present
4 for absorption of the uranium.

5 And second, the studies in the EPA
6 report she cites show that uranium, once in a
7 plus 6 state, will not be attenuated by
8 reductive acid.

9 So, I don't understand what the
10 argument is here. If the conditions moving
11 out of the mine zone are reductive, then there
12 is no iron oxyhydroxide for absorption. And
13 also, the studies show that reducing uranium
14 from plus 6 to plus 4 does not occur easily.

15 So, I -- either way, I don't see
16 that natural attenuation is applicable.

17 CHAIRMAN BOLLWERK: All right.
18 Well -- yes.

19 DR. JOHNSON: Dr. Bollwerk, I
20 would like to add to that.

21 I have been involved in many, many
22 studies that have to do with the basic
23 chemistry that forms ROLFRENS (phonetic). In
24 other words, there is an oxidation reduction,
25 boundaries and barriers.

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1 And I have looked at samples from
2 these areas, you know, under certain
3 techniques where you can actually see the
4 minerals, and in the normal setting, it is not
5 at all uncommon -- in fact, it is the common
6 situation to have pyrite, which is the reduced
7 species of iron surrounded by iron hydroxide
8 because, over time there is a lot of dynamics.

9 Water is flowing through. So, you
10 start -- so, it is not a clear situation where
11 this is reduced and this is completely
12 oxidized.

13 Generally speaking, in these
14 environments, you have got the presence of
15 pyrite and you have got the presence of iron
16 hydroxide and the predominance changes because
17 this is a very dynamic system.

18 So, the situation could be that
19 the iron hydroxide is available for
20 absorption. At the same time that you get
21 into, you know, into -- starting to get into
22 that more reducing environment by oxygen
23 levels declining.

24 And what -- what is required for
25 the uranium plus 6 to go back into the uranium

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1 plus 4 are electrons, and there needs to be
2 what is called in the -- in the science,
3 electron donors, and there can be a variety of
4 these electron donors.

5 But if the -- and that is what
6 some of the studies are showing, that you have
7 to have the right electron donors to provide
8 the electrons to make that reaction happen.

9 And, carbon, carbonate, you know,
10 carbon materials are the common ones, and
11 these -- if you have looked at the thin
12 sections, mineralogical thin sections or if
13 you looked at these under SEF, you see carbon.

14 And so, now, the right kind of
15 carbon might not be there in every little
16 spot, but if you look at it in a larger scale,
17 the carbon is generally sufficient to provide
18 the electrons required for the transformation
19 from uranium plus 6 to uranium plus 4.

20 CHAIRMAN BOLLWERK: All right.
21 Dr. Abitz.

22 DR. ABITZ: Dr. Johnson certainly
23 makes a point that would be valid, but the
24 question is, how much time is required for the
25 transfer of those electrons to reduce uranium.

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1 And the studies and the reports
2 she cites show that that does not happen in a
3 very rapid time frame.

4 And I forget what Xu and Soto
5 (phonetic) was the report where they said
6 that, once you have uranium in a plus 6 state
7 it is very difficult to remove it by reductive
8 capacity in a short period of time.

9 So, I am just citing that report
10 that was in the report that Dr. Johnson noted
11 yesterday.

12 DR. JOHNSON: Judge Bollwerk, and
13 I think in that case, when it comes to the ISR
14 facilities in the Powder River Basin, you
15 know, the proof is in the pudding, so to
16 speak, and the -- and that is where it is
17 important, this postrestoration approval
18 monitoring that was done at the A wellfield at
19 Smith Ranch, and that is a -- I think that is
20 037.

21 It was discussed yesterday, but --
22 the NRC Exhibit 037. And, you know, if -- and
23 that shows quite clearly that the -- in a very
24 short distance over -- and this was from 2005
25 to 2012, that natural attenuation appears to

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1 be effective in over -- just a very short
2 distance, because the perimeter monitoring
3 wells, they, within about 400 feet or 500
4 feet, maybe, of the -- the production well
5 that shows the high concentrations, they have
6 started out less than the drinking water
7 standard, .03 milligrams per liter, and they
8 have remained.

9 Then, if you move inward into the
10 wellfield, the -- there is a well that is
11 showing decline over time, not an increase,
12 and we could -- if you -- if it is of
13 interest, we can put that figure up on the
14 screen and you can look at it and I can
15 explain it.

16 But, you know, the proof is in the
17 pudding and this is one example where it
18 appears to be working.

19 CHAIRMAN BOLLWERK: All right.
20 Dr. Abitz, anything further?

21 DR. ABITZ: Nothing further at
22 this time.

23 CHAIRMAN BOLLWERK: All right.
24 Anything from Strata?

25 MR. PUGSLEY No, sir.

1 CHAIRMAN BOLLWERK: You are not
2 going to hop in the middle?

3 MR. KNODE: Out-gunned here.

4 CHAIRMAN BOLLWERK: Okay. Dr.
5 Johnson, anything further? You are well-done.

6 All right. Let me just see.

7 Judge Cole, I will come to you in
8 a second.

9 Judge White, anything, from what
10 we heard?

11 JUDGE WHITE Not right now. Maybe
12 I can ask the witnesses during the -- if
13 something else comes up on this topic at a
14 later point.

15 CHAIRMAN BOLLWERK: Okay. There
16 will probably be another opportunity when they
17 will all be on the stand together, I think.
18 So --

19 JUDGE WHITE: Yes.

20 CHAIRMAN BOLLWERK: All right.

21 JUDGE WHITE: So, no questions
22 right now.

23 CHAIRMAN BOLLWERK: Judge Cole,
24 did you have anything?

25 JUDGE COLE: I have no --

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1 CHAIRMAN BOLLWERK: Is that a "No,
2 I think"?

3 Try again. We didn't quite catch
4 that.

5 JUDGE COLE: I have nothing.

6 CHAIRMAN BOLLWERK: All right. I
7 think that is a no. Okay.

8 So, let me turn to the parties a
9 second. While I -- I don't think there is
10 anything -- well, let me ask you. Does anyone
11 have any cross-examination questions they want
12 to propose, or cross-questions?

13 MR. PUGSLEY None from Strata.

14 CHAIRMAN BOLLWERK: All right.

15 MS. MONTEITH: No, Your Honor,
16 none from the staff.

17 MR. CRYSTAL: None from the
18 Intervenors, Your Honor.

19 CHAIRMAN BOLLWERK: All right.
20 Then, I see that the e-filing document has
21 made it into the system. So, we will go ahead
22 at this point, if there is no objection --

23 MR. KNODE: No. No objection.

24 MR. CRYSTAL: No objection.

25 CHAIRMAN BOLLWERK: -- and go

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1 ahead and move Exhibit NRC 052, admitted into
2 the record.

3 All right. And I think we are
4 done at this point. Thank you very much, all
5 of you. Appreciate very much the information
6 you provided us.

7 All right. Is there anything else
8 we have on Contention 1 at this point? And,
9 it sounds like Judge White might want to
10 review something later, but we will take care
11 of that at the time if we need to.

12 So, I think we are ready for
13 Contention 2, and you all had requested that
14 you go ahead and -- that you be allowed to
15 make an opening statement as we went from
16 Contention-to-Contention.

17 Let me do one thing before you
18 start. Let me see if I can hide this away
19 some place here. Let me just read the
20 contention again very briefly.

21 This is Environmental Contention
22 2. The title is the "FSEIS fails to analyze
23 the environmental impacts that will occur if
24 the applicant cannot restore groundwater to
25 primary or secondary limits."

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1 And the Contention, itself,
2 states, "The FSEIS fails to meet the
3 requirements of 10 CFR Sections 51.90-94 and
4 NEPA, because it fails to evaluate the virtual
5 certainty that the applicant will be unable to
6 restore groundwater to primary or secondary
7 limits in that the FSEIS does not provide and
8 evaluate information regarding the reasonable
9 range of hazardous constituent concentration
10 values that are likely to be applicable if the
11 applicant is required to implement an
12 alternative concentration level, ACL, in
13 accordance with 10 CFR Part 40, Appendix A,
14 Criterion 5(b)(5)(c).

15 All right. At this point, then, I
16 will turn to counsel for Strata and see what
17 you have to tell us about with respect to this
18 contention

19 MR. PUGSLEY All right. Thank
20 you, Your Honor.

21 With respect to Contention 2,
22 Strata's position is that the FSEIS and the
23 entire record of decision adequately addresses
24 groundwater restoration and the satisfaction
25 of NRC regulatory requirements for successful

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1 restoration at 10 CFR Part 40, Appendix A
2 Criterion 5(b)(5).

3 For purposes of this contention,
4 Strata will rely on the expert testimony of
5 Mr. Schiffer, Mr. Demuth, Mr. Lawrence and Mr.
6 Knode.

7 With respect to this Contention,
8 Intervenors have alleged that the FSEIS does
9 not adequately assess potential impacts
10 associated with the virtual certain failure to
11 restore site groundwater to NRC primary or
12 secondary standards.

13 Here, Intervenors' prefiled
14 submissions demonstrate a lack of
15 understanding of the various statutory and
16 regulatory programs associated with ISR
17 licensing and operations, including successful
18 groundwater restoration.

19 First, the Intervenors' prefiled
20 submissions have either ignore or
21 fundamentally mischaracterize the
22 applicability of the Safe Drinking Water Act
23 and its Aquifer Exemption Program to ISR
24 operations, especially when referring to the
25 applicability of MCL's and permitting ISR

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1 operations.

2 These aquifer exemptions are
3 mandatory approval that must be obtained prior
4 to commencement of licensed operations and
5 specifically state that an exempted aquifer or
6 portion thereof cannot now, nor ever in the
7 future, serve as a source of public drinking
8 water.

9 And such exemptions cannot be
10 revoked under current EPA UIC program
11 requirements.

12 Second, as discussed in Strata's
13 position statements, the concept of successful
14 groundwater restoration for in situ recovery
15 facilities is based on Criterion 5(b)(5)
16 standards requiring groundwater restoration to
17 be conducted to Commission-approved background
18 or an MCL, whichever is higher, or an
19 alternate concentration limit.

20 The concept of an ACL as a third
21 alternative to Commission-approved background
22 or an MCL has resulted from an initial EPA
23 rulemaking under the Resource Conservation and
24 Recovery Act or RCRA, that was then
25 incorporated into EPA's Uranium Mill Tailings

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1 Radiation Control Act, based generally-
2 applicable standards in 40 CFR Part 192.

3 And then, during its conforming
4 rulemaking, the Commission adopted these
5 standards into Criterion 5(b)(5).

6 The viability of an ACL as a third
7 alternative to groundwater restoration and its
8 potential environmental impacts have been
9 vetted fully in these -- these three
10 rulemakings, all offering the public an
11 opportunity to comment and challenge such
12 rules, and the resulting regulations cannot be
13 challenged in this proceeding.

14 ACL's, by definition, are a site-
15 specific, constituent-specific risk-based
16 human-health standard, based on 19 applicable
17 criteria under 10 CFR, Part 40, Appendix A,
18 Criterion 5(b)(6), and NRC guidance, allowing
19 the use of restoration now as a justifying
20 factor to prior class of use.

21 And that would -- that,
22 effectively, by definition, demonstrates that
23 there are no irretrievably commitment of
24 resources or irrevocable impacts from an ACL.

25 ACL's, for all uranium recovery

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1 facilities, including both conventional, heat-
2 leached and in situ recovery facilities.

3 They have now determined that
4 Criterion 5(b)(5) applies as a matter of law
5 to ISR's, and they require separate license
6 amendment applications with full-fledged 10
7 CFR Part 51 NEPA environmental reviews where
8 a potential impact referenced by Intervenors'
9 must be assessed.

10 Further, in order for NRC to even
11 evaluate the site-specific, constituent-
12 specific parameters associated with an ACL
13 review, and ISR licensee must have established
14 Commission-approved background for Criterion
15 5(b)(5) and obtained all water quality data
16 during restoration postoperations and must
17 satisfy the as low as reasonably achievable
18 principle, even before the agency will allow
19 a licensee to apply for an ACL.

20 Intervenors allege that the ISR
21 industry has not been successful with
22 groundwater restoration, in that they have not
23 restored every constituent of concern to
24 Commission-approved background or an MCL,
25 whichever is higher.

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1 But they failed to note that
2 successful groundwater restoration is defined
3 as compliance with Criterion 5(b)(5)
4 requirements, which includes as a third
5 alternative an ACL.

6 The aforementioned prior class of
7 use standard has been applied successfully
8 that restorations at Cameco Smith Ranch,
9 Highland site, it's Crow Butte site and
10 Uranium One's Irigaray wellfields, and thus,
11 have not resulted in an irretrievable
12 commitment of resources or irrevocable
13 impacts.

14 NRC staff's 2009 report to the
15 Commission, SEI004A and its supporting data at
16 004B shows no impacts to adjacent nonexempt
17 aquifers and, thus, successful restoration has
18 been demonstrated.

19 Specific to the Ross site,
20 Strata's new vetted data demonstrates
21 restoration was successful within the Ross
22 project area, as it was approved by both NRC
23 under source material license and Wyoming
24 Department of Environmental Quality with the
25 license ultimately being terminated by NRC.

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1 NRC staff's FSEIS and the entire
2 record of decisions specifically addresses
3 restoration techniques and potential impacts
4 at SEI009A, at pages 118 through 121 and
5 SEI010 at pages 309 to 318.

6 With that said, Your Honor, I
7 respectfully submit that the FSEIS and the
8 record of decision adequately addresses the
9 substance of this Contention and Intervenors'
10 allegations should not result in a
11 modification of the FSEIS or the record of
12 decision.

13 Thank you.

14 CHAIRMAN BOLLWERK: Thank you,
15 sir.

16 I will turn to the staff.

17 MS. MONTEITH: Good morning, Your
18 Honor.

19 The staff's witnesses for
20 Contention 2 are John Saxton and Johari Moore
21 from whom you heard yesterday, and Kathryn
22 Johnson from whom you heard yesterday and this
23 morning.

24 In Contention 2 is admitted and
25 limited by the Board. The Intervenors argue

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1 that the FSEIS fails to analyze the
2 environmental impacts that will occur if
3 Strata cannot restore groundwater to primary
4 or second limits.

5 Specifically, they claim that the
6 FSEIS does not provide and evaluate
7 information regarding the reasonable range of
8 hazardous constituent concentration values
9 that are likely to be applicable if Strata is
10 required to implement an alternate
11 concentration limit or ACL for the Ross
12 project.

13 CHAIRMAN BOLLWERK: You may need
14 to pull that back just a little closer.

15 MS. MONTEITH: A little closer.

16 CHAIRMAN BOLLWERK: Thank you.

17 MS. MONTEITH: There are two
18 important points, however, that the Board
19 should keep in mind.

20 First, the staff's conclusion in
21 the FSEIS regarding the potential impacts from
22 the Ross project expressly accounts for the
23 possibility that Strata may require an ACL.

24 The staff explains in the FSEIS
25 that a licensee would be required by its state

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1 permit to mine and by its NRC license to
2 conduct aquifer restoration activities to
3 restore the Orozone (phonetic) Aquifer to
4 primary or secondary limits.

5 If the aquifer cannot be returned
6 to one of these conditions, Strata would be
7 required to seek approval for an alternate
8 concentration limit from the NRC.

9 The NRC would only approve an ACL
10 that it found to be as low as reasonably
11 achievable and that will not pose a
12 substantial present or potential hazard to
13 human health or the environment.

14 That standard is set forth in
15 Criterion 5(b)(6) of 10 CFR Part 40, Appendix
16 A.

17 Because the Commission must make
18 such a finding for any ACL to be approved for
19 the Ross project, the staff is able to
20 conclude that the potential impacts to water
21 quality of the exempted aquifer is expected to
22 be small.

23 This is consistent with the
24 findings and conclusions in the generic
25 environmental impact statement for in situ

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1 leached uranium milling facilities which I
2 believe is in the record as Exhibits NRC 007
3 and NRC 008.

4 Second, in the FSEIS, the staff
5 does, in fact, provide and evaluate
6 information regarding the range of
7 historically-approved alternate concentrations
8 at the three ISR sites for which the
9 Commission has approved restoration in the
10 last two decades.

11 Recognizing this, the Intervenors
12 challenged the adequacy of the data underlying
13 the staff's discussion in the FSEIS.

14 In its written testimony, the
15 staff addressed the specific deficiencies
16 alleged by the Intervenors in the Crow Butte,
17 Smith Ranch and Irigaray restoration
18 approvals.

19 We have also explained that the
20 additional data from the Smith Ranch and
21 Christensen Ranch raised by the Intervenors is
22 not relevant to the FSEIS's analysis and,
23 contrary to the Intervenor's suggestion, the
24 staff did not need to essentially reevaluate
25 the NRC's prior approvals for these facilities

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1 in order to comply with NEPA.

2 The essential fact is that the
3 staff used the best information available in
4 alternate concentration levels that the
5 Commission has historically found to be
6 protective of human health and the
7 environment, and the staff evaluated that
8 information in the FSEIS.

9 As the Commission has recognize
10 NEPA does not call for certainty or precision,
11 but an estimate of anticipated, not unduly
12 speculative impacts.

13 To attempt to satisfy the
14 Intervenors' demands for even more
15 information, which generally challenged the
16 NRC's prior technical assessments for these
17 three ISR sites, go far beyond what NEPA
18 requires in this case.

19 In sum, the staff complied with
20 NEPA by thoroughly describing the FSEIS the
21 impacts that might result from the need for an
22 ACL for restoration of the Ross project.

23 Thank you.

24 CHAIRMAN BOLLWERK: All right.

25 Thank you.

1 I turn, then, to Joint
2 Intervenors.

3 MR. FETTUS: Your Honors, thank
4 you, and may it please the Court. I am
5 Geoffrey Fettus with the Natural Resources
6 Defense Council.

7 CHAIRMAN BOLLWERK: Make sure that
8 -- those are really directional mic's, so --

9 MR. FETTUS: Okay.

10 CHAIRMAN BOLLWERK: Thank you.

11 MR. FETTUS: How is that? Better,
12 Your Honor?

13 CHAIRMAN BOLLWERK: Yes. Thank
14 you.

15 MR. FETTUS: Contention 2
16 challenges whether the EIS has taken the
17 requisite hard look at the environmental
18 impacts that will occur when, as is inevitably
19 the case, the applicant must attempt to
20 restore the groundwater to alternative
21 concentrations of contaminates.

22 Our expert, Dr. Larson, has
23 exposed the fallacy in staff's and Strata's
24 assertions, that environmental impacts will be
25 small and temporary, no matter how degraded

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1 the final alternative concentration limits are
2 in the underground aquifer.

3 The staff's unsupported assertions
4 are contradicted by the substantial amount of
5 data that is in the record, direct from the
6 NRC, itself that demonstrates substantial
7 harm.

8 Specifically, Dr. Larson has shown
9 that if the EIS were to consider the actual
10 baseline conditions on the site and compare
11 those values to the reasonably-anticipated
12 conditions postrestoration, the EIS should
13 have presented and analyzed the fact that the
14 Ross project will have significant
15 environmental impacts. This has not been
16 done.

17 First, and contrary to the
18 testimony you have heard and will hear later
19 today, it is a fact that no ISL mine has ever
20 restored a mined aquifer to its premining
21 water quality.

22 The data in the record before you
23 is uncontroverted, that each and every aquifer
24 has been degraded, in contrast to its premined
25 state, and alternative concentration limits

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1 have been applied to allow the licensee to
2 halt restoration efforts and deem them
3 successful.

4 Second, staff and Strata persist
5 in alleging that any environmental impacts are
6 small and temporary. They attempt to take
7 refuge in restoration to a, quote, class of
8 use, suggesting the water wasn't very good in
9 the first instance and that the aquifer is
10 accordingly exempted, a fact of which we are
11 quite aware, and that NEPA does not somehow
12 require exacting and quantitative analysis.

13 All of this is wrong.

14 To the suggestion that the water
15 is bad in the first place, using NRC's own
16 data, Dr. Larson demonstrated at one site the
17 great majority of the average baseline
18 groundwater samples were either below or
19 barely elevated from the NCL for uranium -- I
20 am sorry. The maximum contaminant limit for
21 uranium. Only a small percentage was more
22 elevated.

23 Next Dr. Larson demonstrated that
24 after mining and restoration, the majority of
25 samples were severely contaminated or just

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1 highly contaminated.

2 In short, drinking water quality
3 samples went from being the great majority to
4 an insignificant minority.

5 To staff and Strata's efforts to
6 contradict Dr. Larson with the suggestion NEPA
7 doesn't require exacting quantitative
8 measurements, they provide assurances
9 restoration has improved and alternative
10 concentration limits can be challenged later
11 at some future indeterminate date.

12 But Dr. Larson's testimony does
13 not turn on characterizations that are
14 speculative or unlikely to occur, rather,
15 based on the NRC's own empirical data from
16 other ISL sites and a rigorous scientific
17 explanation of the deficient manner in which
18 staff has considered and presented other sites
19 in the EIS, Dr. Larson demonstrates that the
20 EIS's conclusions about likely postrestoration
21 values at the Ross site are speculative and
22 run counter to any plain understanding of the
23 terms "large" or "small" or "temporary," and
24 "irreversible."

25 In light of the foregoing, and

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1 contrary to the testimony of SEI and staff,
2 the EIS does not take a hard look at the
3 environmental impacts that will occur when the
4 applicant must attempt to restore the
5 groundwater to alternative concentrations of
6 contaminants.

7 CHAIRMAN BOLLWERK: All right.
8 Thank you, sir.

9 All right. At this point, I think
10 we are ready for the Strata witnesses for this
11 Contention.

12 If you would like to go ahead and
13 have them come up and have a seat in the
14 witness table. And if you would begin by just
15 identifying yourselves for the record,
16 whichever end you would like to start at --
17 on.

18 MR. LAWRENCE: Errol Lawrence,
19 Petrotech Engineering.

20 MR. KNODE: Ralph Knode, Strata
21 Energy.

22 MR. SCHIFFER: Ben Schiffer, WWC
23 Engineering.

24 MR. DEMUTH: Hal Demuth, Petrotech
25 Engineering.

1 CHAIRMAN BOLLWERK: All right.
2 So, you gentlemen, your testimony has
3 previously been admitted with respect to
4 Contention 2, both your direct, prefiled
5 direct testimony and your rebuttal testimony.

6 You do remain under oath, as a
7 reminder, and I guess we will just go ahead
8 and admin the exhibits now, really, relating
9 to Contention 2. I think we have everything
10 else in we need.

11 So, let's start with -- I will
12 check with counsel. SEI035 would be the first
13 one?

14 MR. PUGSLEY Yes, sir.

15 CHAIRMAN BOLLWERK: So we are
16 going to mark for identification the following
17 exhibits, SEI-035, which is an IAEA-TECDOC-
18 720, which is -- IAEA-TECDOC-720.

19 SEI-036, the Moore Ranch FSEIS.

20 SEI-037, which is NUREG/CR6733, a
21 baseline risk-informed, performance-based
22 approach for in situ leach uranium extraction
23 licenses, final report, July 2001.

24 SEI-038, Decision of the DCEQ
25 executive director regarding Uranium Energy

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1 Corporation's permanent number UR03075.

2 (Whereupon, the above-referred-to
3 document was marked as SEI Exhibit No. 035,
4 036, 037, 038, for identification.)

5 CHAIRMAN BOLLWERK: And we are
6 going to skip forward to SEI044.

7 MR. PUGSLEY Yes, sir.

8 CHAIRMAN BOLLWERK: The May 11th,
9 2010 response to Kay Sweeney from Bradley
10 Jones regarding a 6/1/20 -- I am sorry. July
11 -- June 1, 2009 letter to the Commission
12 regarding NRC regulatory issue summary, 2009-
13 05.

14 (Whereupon, the above-referred-to
15 document was marked as SEI Exhibit No. 044 for
16 identification.)

17 CHAIRMAN BOLLWERK: And we are
18 going to skip forward.

19 MR. PUGSLEY I believe that is it,
20 Your Honor.

21 CHAIRMAN BOLLWERK: I am sorry?

22 MR. PUGSLEY I believe that is it,
23 Your Honor.

24 CHAIRMAN BOLLWERK: Is that it?
25 What about -- you are right. It is. I am

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1 into the NRC exhibits. So -- all right. So,
2 those having been identified for the record,
3 are there any objections to their admission?

4 MS. ANDERSON: No objection.

5 CHAIRMAN BOLLWERK: Having heard
6 none, we will go ahead and admit into
7 evidence, then, SEI-035, SEI-036, SEI-037,
8 SEI-038 and SEI-044.

9 (Whereupon, the above-referred-to
10 documents were received into evidence as SEI
11 Exhibit No. 035, 036, 037, 038 and 044.)

12 CHAIRMAN BOLLWERK: Does that take
13 care of everything?

14 MR. PUGSLEY Yes, sir. We are
15 good.

16 CHAIRMAN BOLLWERK: All right.
17 So, let me turn to Judge White and see if he
18 has any questions for these witnesses.

19 JUDGE WHITE: I have no questions
20 for the Strata witnesses on this Contention.

21 CHAIRMAN BOLLWERK: Okay. Judge
22 Cole, do you have any questions for these
23 witnesses on Contention 2?

24 JUDGE COLE: Well, a quick. What
25 significance -- (Inaudible due to telephone

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1 connection failure).

2 CHAIRMAN BOLLWERK: Is there
3 anything we can do?

4 Judge Cole, you are cutting out.
5 We are going to have to try again here. We
6 heard "What significance," and that was it.

7 JUDGE COLE: What is the
8 significance of primary and secondary --

9 CHAIRMAN BOLLWERK: No. We heard,
10 "What is the significance of primary and
11 secondary," and that is the last we heard.

12 JUDGE COLE: And the word
13 "standards."

14 JUDGE WHITE: What is the
15 significance -- I think he saying "What is the
16 significance of primary and secondary
17 standards?"

18 Is that correct, Judge Cole?

19 CHAIRMAN BOLLWERK: Is that it?

20 JUDGE COLE: Yes, that is it.

21 CHAIRMAN BOLLWERK: Sorry. Thank
22 you.

23 MR. LAWRENCE: I might take a stab
24 at that. Errol Lawrence.

25 I assume that you are talking

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1 about primary and secondary groundwater
2 standards and typically, a primary standard is
3 related -- directly related to health effects
4 such as an MCL would be a primary standard.

5 Secondary standards are often
6 standards are that are not necessarily
7 enforceable and they don't necessarily have a
8 health risk.

9 They might be something like --
10 although iron does have some health risk, but
11 a constituent that is -- may cause changes to
12 water where it becomes -- maybe has bad taste
13 or causes staining or sort of less serious
14 health affects.

15 And so, that is my interpretation
16 of primary and secondary standards.

17 JUDGE COLE: Who manages the
18 standards that were identified in earlier as
19 NRC primary and secondary standards?

20 CHAIRMAN BOLLWERK: So who -- I
21 missed the first part. Who --

22 MR. LAWRENCE: Are you referring
23 -- Judge Cole, are you referring to
24 restoration standards?

25 JUDGE COLE: It mentions

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1 standards.

2 MR. LAWRENCE: I think,
3 historically, a lot of times there was a
4 primary goal of restoration was to meet
5 baseline or background water quality, and a
6 secondary standard -- for instance, in the
7 State of Wyoming, was class of use, but I
8 don't know that that terminology is considered
9 appropriate now that everything is governed
10 under Criterion 5(b)(5).

11 JUDGE COLE: Well, the Contention
12 states "Alleged failure of the FSEIS is to
13 analyze the environmental impacts that will
14 occur if the applicant cannot restore
15 groundwater to primary or secondary limits."

16 My question is, who prepared these
17 limits and are they -- where did they come
18 from?

19 CHAIRMAN BOLLWERK: I have to
20 defer to the NRC to define that, then.

21 MR. DEMUTH: If I could weigh-in
22 on that, Judge Cole.

23 Under Criterion 5(b)(5), there are
24 primary and secondary goals of restoration and
25 those are -- those are a goal or they could be

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1 referred to as a limit. They are not a
2 standard.

3 As Mr. Lawrence said earlier,
4 there are EPA drinking water standards that
5 are set by EPA and those are in a different
6 arena.

7 Although one of the goals of
8 Criterion 5(b)(5) can be the maximum
9 contaminant limits which are a Federal
10 Drinking Water Standard.

11 So, the Criterion 5(b)(5) process
12 allows for restoration to baseline
13 concentrations, which is Commission-approved
14 baseline, or MCL's, whichever is higher, or an
15 ACL.

16 JUDGE COLE: All right, sir.
17 Thank you.

18 CHAIRMAN BOLLWERK: All right.
19 Anything else, Judge Cole? No? Judge Cole,
20 is there anything else?

21 JUDGE COLE: No.

22 CHAIRMAN BOLLWERK: Thank you.

23 All right. Anything you want to
24 follow up in terms of that?

25 JUDGE WHITE: No, nothing else for

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1 me.

2 CHAIRMAN BOLLWERK: All right.

3 JUDGE WHITE: I have one question
4 for the panel. In terms of the analysis the
5 NRC staff did -- well, we will call, for want
6 of a better term, the bounding analysis that
7 they did in the FSEIS.

8 Did you all have any input to that
9 to agree with that to the degree where you are
10 aware of RAI's or anything like that, request
11 for additional information that were directed
12 to you that provided input to that directly or
13 --

14 MR. SCHIFFER: Judge Bollwerk,
15 this is Ben Schiffer, and I don't believe that
16 we had any RAI's that directly went to this,
17 although I can say that in a technical report
18 in regards -- in Chapter 6, we would conduct
19 a preliminary bounding analysis looking at
20 other sites to establish where this project
21 stood in terms of differing water quality and
22 estimates of -- estimates of postmining water
23 quality.

24 So, it set the stage for staff to
25 do that, and I would be happy, if we want to

1 look at that exhibit, there are several
2 tables, I believe, that compare the water
3 quality prelicense at Ross, as well as the
4 estimates of postmining water quality, and
5 that are in the technical report which would
6 be Exhibit SEI014C, I believe, if you are
7 interested.

8 CHAIRMAN BOLLWERK: Just refresh
9 my recollection in terms of the timing of that
10 technical report. That came when in the
11 process in terms of relative to the MPIS or
12 the request for more correctly -- or more
13 relevantly, the SEIS. I am sorry.

14 MR. SCHIFFER: Judge Bollwerk,
15 that document was submitted as part of the
16 initial license application in January of
17 2011.

18 CHAIRMAN BOLLWERK: They contain
19 that information, then. Have that information
20 and there wasn't a later amendment that was in
21 the initial --

22 MR. SCHIFFER: No, sir, it was
23 part of the original license application.

24 CHAIRMAN BOLLWERK: All right.
25 Has Strata done any additional analysis or

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1 look at what will be alternative concentration
2 limits potentially for this facility?

3 MR. PUGSLEY Not to my knowledge,
4 Judge.

5 CHAIRMAN BOLLWERK: All right.
6 All right. That was my -- the only question
7 I had.

8 Let's turn to counsel, then, and
9 see if they anticipate any cross-examination
10 questions, or do you need to -- do you need to
11 take a break? I guess that would be the
12 question.

13 MS. MONTEITH: I don't believe we
14 anticipate any cross-examination questions at
15 this time. If we took a break, we may have
16 some, but --

17 CHAIRMAN BOLLWERK: I am sorry.
18 You do or no?

19 MS. MONTEITH: Sorry. It doesn't
20 appear that we have any.

21 CHAIRMAN BOLLWERK: Okay.

22 MR. PUGSLEY Strata doesn't have
23 any, either.

24 CHAIRMAN BOLLWERK: All right.

25 MR. PUGSLEY Your Honor, could we

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1 take five minutes?

2 CHAIRMAN BOLLWERK: Surely.

3 MR. PUGSLEY Thank you.

4 CHAIRMAN BOLLWERK: All right.

5 Judge Cole, we are going to take
6 five minutes, and we will give you a phone
7 call when they come back if there is any
8 questions that they want to propose.

9 So, we will take a break right
10 now.

11 (Whereupon, the above-entitled
12 matter went off the record at 9:15 a.m. and
13 resumed at 9:21 a.m.)

14 CHAIRMAN BOLLWERK: All right.
15 Could we go back on the record briefly.

16 All right. We received a
17 potential question from the -- from Strata, so
18 we are going to take about a five-minute
19 break, hopefully no more, and the Board will
20 consult and we should be right back. Thank
21 you.

22 (Whereupon, the above-entitled
23 matter went off the record at 9:21 a.m. and
24 resumed at 9:28 a.m.)

25 CHAIRMAN BOLLWERK: Okay. If we

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1 can go back on the record, please.

2 Okay. We have one question we
3 would like to ask.

4 Is it practical to estimate at
5 this stage of the licensing process what
6 parameters may require a potential future ACL,
7 and at what potential concentration?

8 MR. LAWRENCE: Judge Bollwerk, I
9 would like to answer that question.

10 CHAIRMAN BOLLWERK: All right.

11 MR. LAWRENCE: Errol Lawrence,
12 Petrotech. It is not practical for a number
13 of reasons. An ACL is a site-specific,
14 constituent-specific risk-based groundwater
15 protection standard.

16 A key component of an ACL process
17 is a corrective actions assessment, which
18 includes an evaluation of the restoration that
19 was done at the site and any additional
20 corrective actions that may have been
21 implemented.

22 Also, it includes an ALARA
23 analysis of the effectiveness of the
24 restoration, and other corrective actions, and
25 an analysis of a potential alternative

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1 corrective action.

2 So, there is a lot involved on the
3 tail end, based on the final results of the
4 restoration to go into an ACL determination.

5 So, to predict on the front end of
6 what those numbers would be, even which
7 constituents would be still elevated after
8 restoration would be premature and not really
9 based on any actual data.

10 CHAIRMAN BOLLWERK: All right.
11 Anything further you have?

12 JUDGE WHITE: No.

13 CHAIRMAN BOLLWERK: Anything
14 further, Judge Cole?

15 JUDGE COLE: No.

16 CHAIRMAN BOLLWERK: All right.
17 Anything further from any of the parties?

18 MR. FETTUS: No, Your Honor.

19 CHAIRMAN BOLLWERK: All right.
20 Then, gentlemen, we thank you at this point
21 for your -- the information you provided this
22 morning.

23 Don't go away. I am sure we will
24 have you back again, and we will now move to
25 the staff witnesses for this particular

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1 Contention, which is Contention 2.

2 All right. Good morning and
3 welcome back. If -- go ahead and pour your
4 water and we will -- if you all, to begin,
5 could go ahead and identify yourselves for the
6 record, please, and you need to pull those
7 microphones down in front of you, obviously.

8 MS. MOORE: Johari Moore, NRC.

9 DR. JOHNSON: Kathryn Johnson.

10 MR. SAXON: John Saxton.

11 CHAIRMAN BOLLWERK: All right.

12 And each of you previously has testified. You
13 have been sworn, and you remain under oath.

14 Your testimony has already been
15 admitted relative to this Contention and so
16 what we need to take care of now are the
17 additional exhibits.

18 Just make sure I am on the right
19 page. Okay. And so, I am going to start with
20 NRC-021, which is a 2003 NRC document, NUREG
21 1620, Standard Review Plan for the Review of
22 a Reclamation Plan for Mill Tailing Sites
23 under Title 3 of the Radiation -- of the
24 UMTRCA, basically.

25 NRC-022, which is the Appropriate

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1 Resources 2000 report, Mine Unit 1,
2 Restoration Report Submittal and Request for
3 License Amendment.

4 And again, we are identifying
5 these for the record.

6 NRC-023, Appropriate Resources
7 2001 Report Response to NRC Request for
8 Additional Information Related to Mine Unit
9 One Groundwater Restoration Completion at Crow
10 Butte Project.

11 NRC-024, Appropriate Resources
12 2002 Mine Unit One, Groundwater Stability
13 Data.

14 NRC025, an NRC 2001 report, or
15 document, License Amendment 11 for the Crow
16 Butte Facility.

17 NRC026, a 2003 NRC Document
18 License Amendment 15, Wellfield Number One,
19 Restoration Acceptance.

20 NRC027, an NRC 2004 document,
21 Smith Ranch, Highland Project, NRC Review of
22 A Wellfield Groundwater Restoration Report.

23 NRC-028, a 2004 PRI Document, the
24 Smith Ranch Highland Project, A Wellfield
25 Ground Restoration Information.

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1 NRC-029, a 2012 Cameco, C-a-m-e-c-
2 o, Document, Highland Uranium Project,
3 2011/2012 Annual Report for Permit 603.

4 NRC-030, a 2005 COGEMA Document,
5 Response to LQD/DEQ Comments on -- is it
6 Irigaray?

7 MS. MONTEITH: I believe that it
8 is Irigaray.

9 CHAIRMAN BOLLWERK: Irigaray. I
10 am going to mispronounce that again, I am
11 sure.

12 Irigaray Wellfield Restoration
13 Report.

14 NRC-031 which, again, is a COGEMA
15 Document, 2006, A Response to NRC Request for
16 Additional Information on Irigaray Mine
17 Restoration Report.

18 NRC-033, a COGEMA Document, 2006-
19 B, a Summary Table, Response to NRC Request
20 for Additional Information on Irigaray Mine
21 Restoration Report.

22 NRC-033, again, an NRC Document,
23 2006-A, Technical Evaluation Report, Review of
24 Irigaray Mine Restoration Report, Production
25 Units 1 and 9.

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1 NRC-034, an NRC Document, 2006-B,
2 Report Required -- I am sorry. Letter
3 Regarding NRC Review of Irigaray Mine
4 Restoration Report.

5 NRC-035, a Washington -- I am
6 sorry. A Wyoming Department of Environmental
7 Quality, 2005 Document, Postmining Groundwater
8 Restoration Demonstration for the Irigaray
9 Mine, Change No. 34.

10 NRC-036, Affidavit of Kathryn
11 Johnson Concerning Drafting Error Identified
12 by Joint Intervenors, and the Strata Ross
13 FSEIS, dated April 10th, 2014.

14 NRC-037, Borch, et al, a 2012
15 Document, Determination of Contamination -- of
16 Contaminant Levels and Remediation Efficacy in
17 Groundwater at a Former In Situ Recovery
18 Uranium Mine.

19 NRC-038, NRC Document 2009-C,
20 Regulatory Issue Summary, 2009 Through '05
21 Uranium Recovery Policy.

22 Skipping ahead, NRC 048, a Wyoming
23 Department of Environment Quality 1993
24 Document, Water Quality Rules and Regulations,
25 Chapter 8, Quality Standards for Wyoming

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1 Groundwater.

2 And, NRC-049. Again, another
3 Wyoming Department of Environmental Quality
4 Document, 2005 Water Quality Rules and
5 Regulations, Chapter 8, Quality Standards for
6 Wyoming Groundwater.

7 (Whereupon, the above-referred-to
8 documents were marked as NRC Exhibits Nos.
9 NRC-021, NRC-022, NRC-023, NRC-024, NRC-025,
10 NRC-026, NRC-027, NRC-028, NRC-029, NRC-030,
11 NRC-031, NRC-032, NRC-033, NRC-034, NRC-035,
12 NRC-036, NRC-037, NRC-038, NRC-048 and NRC-049
13 for identification.)

14 CHAIRMAN BOLLWERK: Did I miss
15 anything?

16 MS. MONTEITH: No, Your Honor.

17 CHAIRMAN BOLLWERK: All right.
18 Then, let's go ahead, then, if there is no
19 objections and, hearing none, we are going to
20 go ahead and admit into evidence NRC-021, NRC-
21 022, NRC-023, NRC-024, NRC-025, NRC-026, NRC-
22 027, NRC-028, NRC-029, NRC-030, NRC-031, NRC-
23 032, NRC-033, NRC-034, NRC-035, NRC-036, NRC-
24 037, NRC-038, NRC-048 and NRC-049.

25 (Whereupon, the above-referred-to

1 documents were received into evidence as NRC
2 Exhibits Nos. NRC-021, NRC-022, NRC-023, NRC-
3 024, NRC-025, NRC-026, NRC-027, NRC-028, NRC-
4 029, NRC-030, NRC-031, NRC-032, NRC-033, NRC-
5 034, NRC-035, NRC-036, NRC-037, NRC-038, NRC-
6 048 and NRC-049.)

7 CHAIRMAN BOLLWERK: Do we have
8 everything? All right. Then, I believe we
9 are ready to talk to these witnesses.

10 And, I think that Judge White does
11 have question this time.

12 JUDGE WHITE: I do have just a few
13 questions. In staff witnesses' rebuttal
14 testimony, that is NRC-044R, page 17, you
15 state three criteria for successful
16 restoration, any one of which is sufficient to
17 meet regulatory requirements.

18 And these are listed as, one,
19 restart a Commission-approved background
20 postlicense, preoperational background.

21 Two, restore to value given in the
22 table in paragraph 5-C of Appendix A, if the
23 constituent is listed in the table and if the
24 background level of the constituent is below
25 the value listed, or.

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1 Three, restore to an alternate
2 concentration limit established by the
3 Commission, which is subject to a finding that
4 the concentration is as low as reasonably
5 achievable and will not pose a substantial
6 present or potential hazard to human health or
7 the environment.

8 Regarding Standard Three, and I --
9 I am not going to paraphrase, but they -- I
10 assume there is a lot of literature about
11 this, these terms, but in a concise way, can
12 you tell me what the standards are that are
13 required -- in other words, where can you find
14 the standards, how do you -- how do you view
15 these standards for these two requirements,
16 one of which is that concentration is as low
17 as reasonably achievable.

18 I think that is commonly referred
19 to as ALARA.

20 And the other standard is that it
21 will not pose a substantial present or
22 potential hazard to human health or the
23 environment.

24 In a brief way, how does staff
25 deal with these two standards?

1 MR. SAXON: I will try to answer
2 that, Your Honor.

3 The requirements are actually in
4 the regulations. It is going to be under
5 5(b)(6).

6 CHAIRMAN BOLLWERK: Yes.

7 MR. SAXON: Within the regulations
8 and the Criterion 5(b)(6), Appendix A, and
9 also on the guidance document -- I forgot
10 which one has the ACL limits.

11 We have a staff position paper
12 about what needs to be done for ACL. It fits
13 the criteria in Appendix A and that is what
14 they have to let an application for, an ACL,
15 or need to be included.

16 I will get you that document after
17 I -- I think it is 1620.

18 JUDGE WHITE: Under your general
19 guidance?

20 MR. SAXON: Yes.

21 CHAIRMAN BOLLWERK: So, have we
22 given it an exhibit number yet, or is that --
23 I think that is --

24 JUDGE WHITE: Yes. That is an SE,
25 and I believe that is an SEI exhibit.

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1 CHAIRMAN BOLLWERK: Okay.

2 JUDGE WHITE: All right. So, both
3 of those terms, the ALARA term and the NUREG
4 have -- have formal definitions for those,
5 which are -- which you strictly follow?

6 MR. SAXON: That is correct.

7 MR. HARPER: Your Honor, I
8 apologize for interrupting. That exhibit is
9 -- Richard Hart with the NRC staff. That
10 exhibit is NRC Exhibit 021.

11 CHAIRMAN BOLLWERK: All right.

12 JUDGE WHITE: Thank you.

13 DR. JOHNSON: Judge White.

14 JUDGE WHITE: Yes.

15 DR. JOHNSON: May I add just a bit
16 to that?

17 JUDGE WHITE: Yes. Please.

18 DR. JOHNSON: The other part of
19 this that I think is -- it is very important
20 to understand and it is oftentimes a little
21 bit of a confusion, is that the last part of
22 this will not pose a substantial present or
23 potential hazard to human health or the
24 environment.

25 It is the -- that applies to the

1 area outside of the exempted aquifer.
2 Because, outside of the exempted aquifer it
3 can be still protected as an underground
4 source of drinking water, so that in practice,
5 that the way that is -- is managed is to
6 evaluate the concentrations, ACL's that are
7 within the wellfield and -- and then,
8 considering just natural groundwater
9 transport, will the -- the boundary of the
10 exempted aquifer will -- at that point, will
11 that be protective of human health which, in
12 other words, is meeting the drinking water
13 standards outside of that boundary.

14 JUDGE WHITE: I see. Right.
15 Okay. Thank you.

16 Regarding the successive
17 restoration at historical ISL sites and in
18 your NRC-044-R, page 19, bottom, and you are
19 referring to Crowe Butte Wellfield One, Smith
20 Ranch, Highland Wellfield A and Irigaray
21 Wellfields 1 through 9 are the three that are
22 discussed in -- in that testimony.

23 You state, "Although the approved
24 restoration concentrations for uranium
25 concentrations" -- I am not sure I read that

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1 correctly -- "at these sites exceeded
2 postlicensing preoperational values. They did
3 not exceed Class 1 domestic use standard of
4 five milligrams per liter."

5 That is a Wyoming standard.

6 You go on to state later that the
7 standards have changed. Would the restoration
8 at those sites have met the new standards, to
9 your knowledge, that are -- are in place for
10 Class 1 domestic use?

11 MR. SAXON: Without going back and
12 actually reviewing what they reviewed as part
13 of the acceptance, it would be hard for me to
14 speculate on that.

15 What I would say is that an
16 applicant now would have to submit an ACL
17 application and one of the parameters may be
18 the class use. That is one of the criteria,
19 is that what is the existing groundwater uses.

20 But it is not the sole criteria,
21 but they would have to do a hazard assessment
22 in the potential receptors.

23 What the previous restorations did
24 entail is an actual groundwater model to show
25 that outside the area that the -- impacts to

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1 the surrounding RSDW (phonetic) were not
2 impacted.

3 JUDGE WHITE: So, if at these
4 three sites, if any -- any or all of them no
5 longer met this -- this class standard, in
6 other words, if they did, in fact, exceed the
7 original class standards set by -- and those
8 are, if I am correct, set by the state. Is
9 that right? Yes.

10 If, in fact, they did exceed those
11 and ACL's were required, would the applicant
12 then be required to request a license
13 amendment in order to establish ACL's? Would
14 there be another step if -- if -- if these
15 standards had been different than what they
16 were then?

17 MR. SAXON: Again, it is really
18 hard to go back without really looking at it,
19 because you have to understand the class of
20 use doesn't just look at uranium. It looks at
21 other parameters, like radium and that is kind
22 of one of the primary drivers.

23 If the radium exceeds a class of
24 use, then for the overall, that class of use
25 is not a standard.

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1 So, if radium exceeds the MCL then
2 the regulations in the class of use is not
3 applicable for that drinking water or other
4 parameters.

5 JUDGE WHITE: Yes. In this
6 testimony, one of you is making the point that
7 -- that although the restoration
8 concentrations exceeded background, they did
9 not exceed the state class for that water.

10 And you are making a point there
11 that that was a measure of success. My
12 question, as I said was, would that measure of
13 success be met today using revised state
14 standards for uranium, because that is
15 specifically what you are talking about here
16 is uranium.

17 MR. SAXON: If I may, Your Honor,
18 when that restoration was reviewed, we were
19 under Commission directives to incorporate the
20 state's standards, and that is -- you know, I
21 don't know what the exact process was, but
22 they were -- we were directed to use the
23 standards themselves.

24 We are no longer doing that. So,
25 there is going to be a slight change in how we

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1 evaluate, you know, whether or not they meet
2 the state standard.

3 They have to meet our standard,
4 which is the ACL. We can take into account
5 the class of use for the -- for the exempted
6 aquifer, yes, in this case, or surrounding
7 aquifers as one of the factors that we do in
8 our evaluation.

9 Now, overall for us, Wyoming would
10 be doing a review strictly on the exempted
11 aquifer to make sure that it has been restored
12 to their class of use.

13 So, there is going to be two
14 independent reviews now. It couldn't meet the
15 Wyoming standard there without then meeting
16 our ACL, all our standards for that.

17 So, it is going to -- there is
18 going to be possibly some restorations that
19 were -- met the Wyoming standards, but it
20 didn't meet ours, or vice versa. I don't know
21 what a vice versa case would be because I
22 think our -- our standard is a little bit more
23 stringent.

24 DR. JOHNSON: Judge White.

25 JUDGE WHITE: Yes.

1 DR. JOHNSON: If I could just add
2 to that. These -- these three sites, as I
3 understand the record, because uranium met the
4 class of use standard or was below that, those
5 constituents, there was no so-called ACL
6 requested for those constituents.

7 There was -- they did go through
8 the process of requesting a license amendment
9 because there were ACL's requested for other
10 constituents.

11 JUDGE WHITE: I see.

12 DR. JOHNSON: So they did go
13 through that process.

14 Now, regarding uranium -- and here
15 again, my understanding of the record is that
16 when the -- right currently, uranium is not a
17 listed constituent for the Wyoming groundwater
18 standard for the class of use, so there isn't
19 a number for uranium right now on the list of
20 parameters for the class of uses in Wyoming.

21 JUDGE WHITE: Okay. So this --
22 this former standard of five milligrams per
23 liter no longer holds, but has not been
24 replaced with a new standard. Is that you are
25 saying?

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1 DR. JOHNSON: Well, it was -- my
2 read of it, it just simply was uranium as a
3 constituent, including the numerical value
4 that was associated with it just was deleted.

5 JUDGE WHITE: I see. Okay. I
6 think that answers my issues with that.

7 That is all I have.

8 Judge Cole, do you -- do you want
9 to weigh in here on this?

10 JUDGE COLE: Yes. My question has
11 to do with the staff, in their reading that
12 the impact operating these would be small and
13 the basis for that decision was the ISL that
14 you discussed.

15 The intervenors in many places in
16 their testimony, that they didn't consider the
17 impact to be harmless, and not small. They
18 almost stated the rationale for the staff
19 seems to be the same.

20 Could you describe that rationale,
21 particularly on the Ross project?

22 CHAIRMAN BOLLWERK: Let me see.
23 Did you all understand the question, or do we
24 need to get him to try to repeat or to try to
25 decipher it?

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1 Would it be helpful if he picked
2 up the hand set and did this, because the
3 microphone he is using going to be --

4 JUDGE COLE: Well, I am not
5 getting through?

6 CHAIRMAN BOLLWERK: Well, you are
7 -- sometimes, but unfortunately it is hard to
8 piece the question together.

9 MS. MOORE: Your Honor, I think I
10 understood the question.

11 CHAIRMAN BOLLWERK: If you
12 understood the question. I am not trying to
13 ask each of you to answer a question you don't
14 understand.

15 So -- they are going to take a
16 shot at trying to respond to your question.
17 They think they understand it. If it is not
18 clear from their answer, we will have to ask
19 you to repeat it again. We will go ahead and
20 try it.

21 MS. MOORE: I heard, Judge Cole
22 asking if the other projects determined that
23 the impacts from an ACL would be small and I
24 just want to clarify that the small impacts
25 determination is a NEPA determination.

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1 It is not an actual determination
2 that occurred after the -- or with the
3 approval of the restoration of its NEPA terms.

4 So, when we want to look to see if
5 other sites also had that small determination,
6 what we are looking at is other NEPA documents
7 for ISR projects, and what we are looking at
8 specifically is the GEIS that is the document
9 that the new ISR SEIS's are tearing from.

10 And the Ross SEIS is the fifth
11 SEIS hearing from the GEIS. The GEIS did have
12 a small impacts determination for impacts due
13 to aquifer restoration and I believe that the
14 other four SEIS's prior to Ross also had that
15 determination, but I think it would be a good
16 idea to look to be sure.

17 I don't want to speculate or
18 assume, but --

19 JUDGE COLE: If that is the case,
20 it could be also --

21 MS. MOORE: Yes. For the Ross
22 project, at least for Ross and Powertech,
23 those two documents were being prepared at the
24 same time, but I do know that for the three
25 SEIS's for Moore Ranch, Nichols Ranch and Lost

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1 Creek, we did all have the same determination.

2 And it is basically based on the
3 fact that the GEIS laid forth the methodology
4 for determining impact due to aquifer
5 restoration and it is based on the fact that
6 the applicant or licensee at that point would
7 have to restore the groundwater to Criterion
8 5(b)(5), which determines that it would pose
9 no significant hazard to human health.

10 And the small impact determination
11 in the GEIS and the FSEIS is that the
12 environmental impacts are not detectible or
13 are so minor that they will neither
14 destabilize, nor noticeably alter any
15 important attribute of the resource
16 considered.

17 A large impact means that the
18 environmental impacts are clearly noticeable
19 and are sufficient to destabilize important
20 attributes of the resource considered.

21 We have not found that an ACL,
22 which would have no -- pose no current or
23 potential hazard to human health would also
24 destabilize important attributes of the
25 resource considered.

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1 When we look at the important
2 attributes of groundwater, we consider that to
3 be how the groundwater is used and if the
4 groundwater is exempted as a source of
5 drinking water, then that is something that
6 goes into our determination of what would
7 destabilize that resource.

8 And so, it falls from the GEIS
9 that these impacts would be small because they
10 would neither destabilize or noticeably alter
11 an important attribute of the groundwater.

12 JUDGE COLE: On destabilizing
13 means you would do so? The change is used for
14 drinking water.

15 MS. MOORE: Yes.

16 JUDGE COLE: And nothing changed
17 there. And that is the principal reason why
18 you wind up with a determination that it is
19 small?

20 MS. MOORE: Yes, Judge Cole.

21 JUDGE COLE: Okay.

22 CHAIRMAN BOLLWERK: All right.
23 Does anybody else have anything on that -- did
24 that -- do you have any further questions,
25 Judge Cole, or did that -- did that response

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1 take care of your question?

2 JUDGE COLE: The response takes
3 care of my question. Thank you.

4 CHAIRMAN BOLLWERK: All right. Do
5 you have anything further on that?

6 JUDGE WHITE: Nothing further.

7 CHAIRMAN BOLLWERK: I have a
8 couple of questions -- as well as the fact we
9 may well have you all back to the panel after
10 we are done with all -- hearing from all of
11 the witnesses.

12 Let me kind of go through the
13 process here as you -- I guess, as you talked
14 about it in terms of the three steps that it
15 could be, or the three standards it might be
16 in terms of -- in the context of granting
17 staff approval for a restoration program.

18 So, the first one is restore to
19 Commission-approved background postlicense,
20 preoperational background.

21 And I take it if an applicant
22 comes in and says they want to do that, is
23 that a license amendment or is that just a
24 request?

25 I mean, is that -- that doesn't

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1 involve a license amendment, I take it?

2 MR. SAXON: No, that would not --
3 when in the restoration program, if they met
4 the Commission-approved background, our
5 interpretation is that that doesn't pose any
6 incremental harm to the aquifer.

7 CHAIRMAN BOLLWERK: All right.

8 MR. SAXON: Because that is what
9 was existing before.

10 CHAIRMAN BOLLWERK: So, that is
11 something they just come in and say, "We plan
12 on doing this" and you would say, "That is
13 fine because that is what we" --

14 MR. SAXON: Yes.

15 CHAIRMAN BOLLWERK: -- "the first
16 standard to meet in any event, so" --

17 MR. SAXON: Yes.

18 CHAIRMAN BOLLWERK: All right.

19 So, looking at the second
20 standard, "Restore to value given in Table --
21 in paragraph 5C of Appendix A. If a
22 constituent is listed in the table and if the
23 background level of the constituent is below
24 the value listed." Does that require a
25 license amendment?

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1 MR. SAXON: No, Your Honor. Well,
2 actually, I will clarify that. That table at
3 the time was the MCL's for those specific
4 parameters.

5 They have subsequently changed and
6 there are additional ones that are added to
7 the MCL. For instance uranium has been added,
8 and going -- if we met the MCL for some of
9 those parameters that are not listed on that
10 table, that would be an ACL, because it is an
11 alternate concentration limit.

12 So, -- but to show that it is
13 protective would be a lot easier than
14 establishing another ACL that is not --
15 doesn't have an established or regulatory
16 criteria.

17 CHAIRMAN BOLLWERK: All right.
18 So, it sounds like, in terms of license
19 amendments, all roads lead to ACL's?

20 MR. SAXON: That is correct.

21 CHAIRMAN BOLLWERK: All right.
22 And so, I guess -- well, the question would be
23 relative to number one and number two, have
24 any applicant -- I am sorry. Have any
25 licensees ever come and requested approval

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1 under one or two?

2 MR. SAXON: No, Your Honor.

3 CHAIRMAN BOLLWERK: So, everyone
4 has been under number three, up to this point,
5 anyway?

6 MR. SAXON: Number -- it would be
7 under -- at the time it wasn't an ACL because
8 we were instructed to use the class of use
9 standard.

10 So, in order to -- but it is
11 confusing, but that is called the secondary
12 standard or -- it is not an alternate
13 concentration of an ACL. It was an alternate
14 standard, if you will, but it doesn't meet our
15 ACL standard.

16 CHAIRMAN BOLLWERK: Right.

17 MR. SAXON: So if they came in and
18 requested that the approved restoration to the
19 class of use over the -- say, Wyoming, UIC
20 standards.

21 CHAIRMAN BOLLWERK: And that did
22 require a license amendment?

23 MR. SAXON: No, it didn't.

24 CHAIRMAN BOLLWERK: It did not?

25 MR. SAXON: Did not.

1 CHAIRMAN BOLLWERK: So, that is
2 the only instance where you -- where someone
3 has come in and asked for an approval for
4 restoration plan or restoration standard that
5 did not involve a license amendment?

6 MR. SAXON: No, it didn't. No,
7 Your Honor.

8 CHAIRMAN BOLLWERK: Great.

9 JUDGE WHITE: I would follow up on
10 that. Still given both NUREG 1569, which I
11 understand has been revised with regards to
12 those three standards, I think that is what
13 you just told us. Is that correct?

14 I think it is NUREG 1569, that is
15 SEI007, page 155 list those -- lists three
16 criteria for -- for meeting restoration
17 success in order, and you are saying those
18 have been revised to what has been described
19 in the rebuttal testimony I cited earlier.

20 Are you familiar -- are you
21 familiar with the restoration criteria that I
22 am referring to? They are numbered.

23 You know, the first is meet
24 baseline and then the second one is -- is
25 restore to class, and the third one is ACL's,

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1 but the restore to class is no longer -- you
2 were saying is no longer used?

3 MR. SAXON: That is correct. When
4 NUREG 1569 came out, that -- we were under
5 instructions to use class of use as a
6 standard.

7 JUDGE WHITE: Right.

8 MR. SAXON: And that would -- that
9 is no -- that is incorrect now. We don't
10 follow that, in the recent ones.

11 And let me clarify. I -- for the
12 class of use, I don't know if there was a
13 CATEX or if there was an EA prepared for each
14 of those. To the best of my recollection, I
15 don't -- I think it was just a CATEX, so there
16 was no environmental document, but I will go
17 back and I can check on that.

18 CHAIRMAN BOLLWERK: Is that an
19 acronym on the --

20 MR. SAXON: Oh. CATEX --

21 CHAIRMAN BOLLWERK: EA is an
22 environmental assessment.

23 MR. SAXON: Yes.

24 CHAIRMAN BOLLWERK: I didn't --

25 MR. SAXON: For -- for NEPA

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1 review, there is a category called
2 "Categorically-excluded."

3 CHAIRMAN BOLLWERK: Oh,
4 categorically-exclusion. Got it. All right.

5 MR. SAXON: So, there -- there was
6 probably an environmental review done. I
7 don't know if it was an EA or CATEX or if
8 there was an opportunity for hearing.

9 I don't think there was an
10 opportunity, but I can get back to you on that
11 if you want.

12 CHAIRMAN BOLLWERK: All right.
13 And a categorically exclusion, again, would be
14 one that is considered to be under the rules
15 of a category, you do not have to have an
16 environmental impact statement or an
17 environmental assessment?

18 MR. SAXON: That is correct, Your
19 Honor.

20 JUDGE WHITE: All right. Does --
21 does NRC staff evaluate a company's attempts
22 at restoring groundwater to background and to
23 ensure that a good-faith effort has been made
24 to do that prior to accepting an ACL?

25 MR. SAXON: That -- yes, Your

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1 Honor.

2 CHAIRMAN BOLLWERK: All right. I
3 think that is all the questions I have at this
4 point.

5 Judge Cole, do you have anything
6 further, given what Judge White and I talked
7 with them about?

8 JUDGE COLE: No.

9 CHAIRMAN BOLLWERK: All right.
10 Then, we will turn to the parties and find out
11 if you all want a couple of minutes to go talk
12 about cross-examination questions.

13 MR. SAXON: Yes, Your Honor. We
14 are going to need 15 or 20 minutes.

15 CHAIRMAN BOLLWERK: Fifteen or
16 twenty minutes. All right.

17 We will, then, go ahead and take a
18 break.

19 Judge Cole, we are going to take a
20 break now for 15 minutes to allow the parties
21 to prepare any proposed cross-examination
22 questions. Thank you.

23 JUDGE COLE: Thank you.

24 (Whereupon, the above-entitled
25 matter went off the record at 10:02 a.m. and

1 resumed at 10:20 a.m.)

2 CHAIRMAN BOLLWERK: Could we go on
3 the record briefly.

4 We have received a proposed
5 question, and so the Board is going to take a
6 brief recess to consult about the question and
7 we should be right back in about ten minutes
8 or less, I would hope. Thank you.

9 (Whereupon, the above-entitled
10 matter went off the record at 10:20 a.m. and
11 resumed at 10:31 a.m.)

12 CHAIRMAN BOLLWERK: All right.
13 Let's go back on the record, please.

14 We have returned from a break for
15 Board consideration of a question that was
16 posed relative to Contention 2, to the staff
17 panel, and we are going to ask the following
18 question, and this is for, at least, initially
19 for Dr. Johnson.

20 You testified that, in evaluating
21 the size and level of the environmental
22 impacts on groundwater, the focus is on the
23 nonexempt aquifer, and that, therefore, the
24 impacts to the exempted aquifer, itself, are
25 immaterial.

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1 Does this mean that if the NRC
2 were to approve an ACL thousands of times
3 above EPA Safe Drinking Water Act Standards
4 for uranium, the impacts would still be small.

5 DR. JOHNSON: Judge Bollwerk, the
6 -- I certainly did not imply that the
7 concentrations of any constituent -- let's use
8 uranium as an example -- inside the exempted
9 aquifer is immaterial.

10 The concentrations that are within
11 the exempt aquifer at the -- at the time,
12 let's say, a restoration is approved, first of
13 all, there are for two reasons, I would say.

14 One is because the way that the
15 approved restorations were done that are
16 discussed in the SEIS were average
17 concentrations over all the wells within the
18 -- the production area.

19 So, that average, of course, would
20 be -- would be higher if there were some wells
21 that were, you know, very, very high
22 concentrations. So, the overall average has
23 to be to, you know, some level that would --
24 would be approved.

25 And so, of course, those levels

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1 are important in any given well in terms of
2 making sure that your average meets the -- the
3 ACL that is ultimately approved.

4 Now, the ACL can't just be any
5 number. It has to be a number that -- a
6 value, a concentration, that, upon evaluation
7 shows that, once you reach the boundary of the
8 exempted aquifer, you are at drinking water
9 standards for constituents, including uranium.

10 So, if the ACL were, you know,
11 let's say, you know, at a ridiculously large
12 number then, in all likelihood, it would not
13 -- you could not demonstrate that it would be
14 protective of the human health and the
15 environment at that boundary of the exempted
16 aquifer.

17 So, the -- you know, the ACL can't
18 just be any number. It has to be a number
19 that meets that, you know, very important
20 criteria that is protective of -- at the -- at
21 the boundary of the exempted aquifer.

22 CHAIRMAN BOLLWERK: All right.
23 Judge White, do you have any --

24 JUDGE WHITE: So, you are -- am I
25 correct that you are saying that -- that the

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1 -- that the aquifer outside the exempt
2 aquifer, at that boundary of the exempt
3 aquifer, is still the standard for deciding
4 whether the impact is small, medium or large
5 and that -- and that you are saying that this
6 -- this example, this hypothetical here with
7 some extremely high value would be reflected
8 in the water quality outside the exempt
9 aquifer, and that is what -- that is still
10 what is -- is what is important?

11 It isn't really what concentration
12 in the exempt aquifer is, it is how the
13 concentration in the exempt aquifer will
14 effect water just outside the boundaries, is
15 that correct, that you are saying that?

16 DR. JOHNSON: Yes. That is
17 correct.

18 CHAIRMAN BOLLWERK: All right.
19 Judge Cole, do you have anything with regard
20 to this question?

21 JUDGE COLE: No.

22 CHAIRMAN BOLLWERK: All right. I
23 will look to the parties briefly. Any -- any
24 other --

25 MR. PUGSLEY No questions.

1 CHAIRMAN BOLLWERK: No.

2 MR. HARPER: No questions.

3 MS. ANDERSON: No, Your Honor.

4 CHAIRMAN BOLLWERK: All right.

5 Very good, then.

6 We thank you all, then, very much
7 at this point. We will probably seeing you
8 again a little -- in a couple of minutes or
9 several -- at some point later this morning.

10 So, thank you very much.

11 All right. Now, we are ready to
12 move forward to the Joint Intervenors'
13 witnesses on Contention 2.

14 MR. FETTUS: Your Honor, before we
15 start, I want to just bring one thing to your
16 attention --

17 CHAIRMAN BOLLWERK: Yes.

18 MR. FETTUS: -- that Mr. Pugsley
19 brought to our attention this morning.

20 CHAIRMAN BOLLWERK: Okay.

21 MR. FETTUS: And we have already
22 filed an errata on it.

23 CHAIRMAN BOLLWERK: Okay.

24 MR. FETTUS: We had inadvertently
25 submitted JTI056 twice and submitted JTI055.

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1 It was the same document.

2 CHAIRMAN BOLLWERK: The same
3 document with the right --

4 MR. FETTUS: JTI056.

5 CHAIRMAN BOLLWERK: Okay.

6 MR. FETTUS: We have since
7 corrected that --

8 CHAIRMAN BOLLWERK: All right.

9 MR. FETTUS: -- and resubmitted it
10 as an errata as JTI055-R.

11 CHAIRMAN BOLLWERK: Okay.

12 MR. FETTUS: And also of note, the
13 ML accession number in the original exhibit
14 list was accurate.

15 CHAIRMAN BOLLWERK: Okay.

16 MR. FETTUS: So, it was merely an
17 oversight on our part, and we want to thank
18 Mr. Pugsley for bringing it to our attention.

19 CHAIRMAN BOLLWERK: All right. We
20 had actually received the email. It has gone
21 through the e-filing system. You probably
22 have, too.

23 And so, what we will -- so, the
24 title that is on it, as well -- it is in the
25 -- the exhibit list is correct. It was just

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1 the document, itself.

2 So, what we will just do is
3 admitted it as the R version --

4 MR. FETTUS: Thank you, Your
5 Honor.

6 CHAIRMAN BOLLWERK: -- and that
7 will -- yes. Thank you for taking care of
8 that.

9 All right. If you would like to
10 bring your witnesses up for -- the Joint
11 Intervenors' witnesses for Contention 2.

12 MR. FETTUS: There is just one.

13 CHAIRMAN BOLLWERK: There is just
14 one. Okay.

15 MR. FETTUS: Yes, Your Honor.

16 CHAIRMAN BOLLWERK: He is sitting
17 in the right place that you can see him? He
18 is good? All right.

19 MR. FETTUS: Good here.

20 CHAIRMAN BOLLWERK: All right.
21 And if you could identify -- I am sorry. Go
22 ahead. Get your papers. All set?

23 I know how it is fooling with
24 papers and a bunch of computers and all that
25 sort of stuff when you are trying to get

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1 straight.

2 All right. Very good. If you
3 could identify yourself for the record,
4 please.

5 MR. LARSON: My name is Dr. Lance
6 Larson.

7 CHAIRMAN BOLLWERK: All right.
8 And, Dr. Larson, there is some dispute about
9 some of -- at least one of the exhibits here,
10 so what I would like to do is go ahead and
11 swear Dr. Larson in, and then we will stop at
12 that point, since his testimony has
13 implications as well as the one exhibit, we
14 will -- we can talk, then, about the exhibit
15 that you filed a motion in limine for.

16 Does that sound like a reasonable
17 approach?

18 MR. PUGSLEY Yes, sir.

19 CHAIRMAN BOLLWERK: All right.
20 So, Dr. Larson, if you would, raise your right
21 hand, and I need an affirmative response to
22 the question.

23 Do you swear or affirm that the
24 testimony you will give in this proceeding is
25 the truth, the whole truth, and nothing but

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1 the truth?

2 MR. LARSON: I do, Your Honor.

3 CHAIRMAN BOLLWERK: Thank you.

4 Right. So, what I would like to
5 do at this point, there is a concern that has
6 been expressed by the Applicant's SEI relative
7 to Contention -- I am sorry. -- to Exhibit
8 JTI005AR -- no. JTI005A-R.

9 Have you got that? Do I got it
10 right, that one? I think that is it, isn't
11 it? That is the right exhibit number. Let me
12 look at it again. JTI005A-R and JTI005B-R.

13 MS. ANDERSON: Yes, Your Honor.

14 CHAIRMAN BOLLWERK: Okay. I guess
15 what we would like to do is, hear briefly from
16 the parties. We read the motion, but this
17 will give you an opportunity again to state
18 your objections.

19 And then, at that point, we will
20 take -- probably take a brief recess, talk
21 with Judge Cole and then come back with a
22 ruling on that and move forward from there.

23 So, let me turn first to the
24 Applicant, since it is your motion.

25 MR. PUGSLEY Thank you, Your

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1 Honor.

2 Just to reiterate the substance of
3 our motion, and bring your attention to 10 CFR
4 Part 2.337A regarding admissibility of
5 evidence, at this proceeding, it should only
6 be admitted if it is, quote, relevant,
7 material and reliable.

8 Both Strata and NRC staff have
9 argued that the evidence associated with these
10 -- these exhibits as storymaps, quote,
11 storymaps cannot be independently verified by
12 its experts if inputted at the hearing.

13 And one additional factor is that,
14 as stated in JTI003-R at page 23, which is Dr.
15 Larson's initial testimony, he is the only one
16 who is allowed to change the parameters.

17 So, there is no way for Strata or
18 NRC staff experts to address that issue to
19 deal with what our parameters are correct, how
20 they can be changed to reflect what we would
21 likely consider a more accurate
22 representation.

23 And we do -- we do not object to
24 the snapshots as you had in your previous
25 order that have been already admitted into

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1 evidence or offered as admitted into evidence
2 on the list.

3 But, we do object to using these
4 storymaps at the hearing to present different
5 scenarios with different parameters that have
6 not been reviewed by NRC's or Strata's
7 experts.

8 And, in addition, we also believe
9 that a previous order issued by Your Honors
10 stated that URL locations were not to be
11 allowed as exhibits in this proceeding, and
12 they are identified as potential exhibits.

13 So, as far as Strata is concerned,
14 we believe that at this time, additional
15 storymap presentations with parameters that
16 have not been collected in snapshots and
17 already offered as evidence previously should
18 not be allowed during this panel.

19 CHAIRMAN BOLLWERK: All right.
20 Thank you, sir.

21 I will turn to the staff.

22 MS. MONTEITH: Your Honor, the
23 staff largely concurs with counsel for
24 Strata's position on this -- the use of the
25 storymaps applications, themselves, in this

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1 hearing.

2 Our concerns are primarily focused
3 on the reliability of the evidence, the
4 ability of the expert witnesses for the
5 Intervenors to change the data should they be
6 so inclined.

7 And also, the ability of the staff
8 to verify the accuracy of the data as
9 presented, and it impacts our ability to
10 testify to the accuracy of that data and form
11 conclusions based upon it, if it is not able
12 to be reviewed in pdf form before they offer
13 testimony on it.

14 CHAIRMAN BOLLWERK: All right.
15 Let me -- is that everything?

16 MS. MONTEITH: Yes, sir.

17 CHAIRMAN BOLLWERK: Let me then
18 turn to the joint intervenors.

19 MR. FETTUS: Your Honor, thank
20 you.

21 The law is well-established under
22 the Federal Rules of Evidence.

23 CHAIRMAN BOLLWERK: Maybe if you
24 could move the microphone a little closer.

25 MR. FETTUS: Sorry, sir. Once

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1 again, I apologize, Your Honor. These are
2 quite directional.

3 CHAIRMAN BOLLWERK: Yes. They are
4 directional.

5 The law is well-established in the
6 Federal Rules of Evidence and what we cited in
7 our opposition to the motions in limine, that
8 experts can rely on evidence that is not in
9 the record, and it is quite clear to us that
10 Dr. Larson has produced these pdf's that are
11 -- that have been offered into evidence for
12 JTI005B-R.

13 How he developed these pdf's are
14 explained in his testimony and how he used the
15 URL's to develop those applications, and for
16 us to have removed those would have entailed
17 a substantial reworking of his testimony,
18 which was something we understood the Board
19 did not want at this time, and that we would
20 have understood would be prejudicial to the
21 other parties.

22 So, in our response, we would be
23 quite happy to offer an exhibit list that
24 removed the URL's from the exhibit list so it
25 is quite clear that they are not offered as

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1 exhibits.

2 And, regarding staff's concern
3 that Dr. Larson could somehow at some future
4 date alter the pdf's that -- that would be
5 created here today.

6 We think, one, their concern is
7 premature. The Board is quite capable of
8 using cross-examination to assure that Dr.
9 Larson produces something that it can then
10 verify right here in front of us.

11 And, secondly, we are also happy
12 to offer seven days, if that -- if that is an
13 appropriate length of time for staff and SEI
14 to ensure that the pdf the Board asks to be
15 produced, if that is what happens here today,
16 is precisely what it purports to depict.

17 So, we think the Board is quite
18 capable of managing this situation through the
19 regular order of cross-examination and, unless
20 the Board has anything further.

21 CHAIRMAN BOLLWERK: I think we
22 have heard from all the parties. I think --
23 we appreciate the opportunity to hear the
24 arguments.

25 Why don't we take a brief recess.

1 We will talk with Judge Cole and we will be
2 right back and make a ruling, and we can move
3 forward from there. Thank you very much.

4 (Whereupon, the above-entitled
5 matter went off the record at 10:45 a.m. and
6 resumed at 10:55 a.m.)

7 CHAIRMAN BOLLWERK: All right.
8 Let's go back on the record, please.

9 The Board has considered the
10 motion and I will give you a brief synopsis of
11 our ruling. Actually, I will give you the
12 whole ruling. It is not going to be a
13 synopsis.

14 We understand the concerns that
15 you all have about making sure that the
16 evidentiary material is somehow in a form that
17 is locked down. That was our original
18 concern, notwithstanding the fact that you
19 all did not object to the original exhibits.

20 When I looked at them, or we
21 looked at them, I had a grave concern about
22 having something that we would call
23 evidentiary material that was not going to be
24 subject to change.

25 One of the problems with the web,

1 it is a great source of information, but
2 things can change at the whim of the person
3 that controls the website, and that obviously
4 doesn't work -- in fact, it doesn't also work
5 for the National Archives and Records
6 Administration purposes, either, but we won't
7 go there. That is a different matter.

8 So, -- but as an evidentiary
9 matter, we want an exhibit that is an exhibit.

10 Having said that, in this
11 instance, I think that, in terms of having to
12 generate any storymaps, if that is even
13 necessary and it is not clear to us it is --
14 will be necessarily at this point, but we will
15 have to see -- we will take that as a -- as we
16 move forward.

17 We do, as the Intervenor has
18 pointed out, had the opportunity to question
19 Dr. Larson about what he has or hasn't done
20 with that website since the exhibit was
21 originally put into place, and I think that is
22 a way that we can ensure ourselves that, if we
23 do have something else generated, that if he
24 is going to give us a truthful answer about
25 what he has or hasn't done anything, and at

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1 that point we will have to make a
2 determination about whether we do or don't
3 allow that storymap to be generated.

4 Having said that, I think the
5 intervenor had two good suggestions, one of
6 which that we -- if they don't mind, we will
7 have them refile the -- both the exhibits
8 again, taking off the URL's cover pages to
9 them. I think that is unnecessary.

10 I think it would be not necessary
11 to have them refile the testimony. I think,
12 as background information, this is the way
13 this was presented. It was the way it was put
14 together, so that URL is there is a matter of
15 information. It is not there as a citation
16 that is evidentiary material.

17 And the other suggestion I thought
18 was a useful one, we had originally suggested
19 that we would be willing to admit the exhibit
20 once the new storymap, once it was put into
21 the e-filing system.

22 What we will do, instead, is we
23 will mark it for identification, assuming we
24 can follow the protocol that we laid out here
25 in terms of getting it pdf and getting it

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1 around to everyone, we will wait seven days
2 and if there are any objections to that, we
3 will hear those at that time and make a ruling
4 as to whether we actually put it into evidence
5 or not.

6 So, I think that is where the
7 Board is at. Let me see if there are any
8 questions or any clarification that anyone
9 needs.

10 Yes.

11 MR. FETTUS: Your Honor, just on
12 point of clarification. Do you want us to
13 refile the exhibit list as well with it just
14 to designate that we have refiled JTI005?

15 CHAIRMAN BOLLWERK: Yes, because
16 it is going to have an "R2" now, so --

17 MR. FETTUS: R2.

18 CHAIRMAN BOLLWERK: Yes. The
19 number is going to change.

20 MR. FETTUS: Got you. Will do.

21 CHAIRMAN BOLLWERK: So, at a
22 minimum, the number will change. So, it is
23 probably best to refile your exhibit list.

24 And you have also got another
25 amended exhibit in any event, so you can take

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1 care of that at the same time.

2 MR. FETTUS: Okay. Thank you,
3 Your Honor.

4 CHAIRMAN BOLLWERK: Surely.

5 So, let me turn to the applicant
6 and staff and see if there are any questions.

7 MR. PUGSLEY Your Honor?

8 CHAIRMAN BOLLWERK: Yes.

9 MR. PUGSLEY Just a clarification
10 if I could, because I am, by far, not an IT
11 person.

12 Is the case of how the storymaps
13 are going to be used today strictly limited to
14 what was offered in JTI005B-R, or am I
15 misunderstanding what was being done, because
16 the --

17 CHAIRMAN BOLLWERK: No. So, the
18 -- those are in evidence -- well, they will be
19 in evidence in theory.

20 The question, then, becomes, as I
21 think the dispute here was over is, are there
22 going to be any new ones generated in the
23 course of the Board's questions.

24 And the answer is, as we outlined
25 in the previous order, the answer is yes,

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1 although there will be the safeguards of, one,
2 we will be talking with Dr. Larson about the
3 -- has he done anything to his website, the
4 inputs that he had since the time, frankly,
5 that the exhibit was put into evidence -- it
6 was marked as prefiled exhibit.

7 MR. PUGSLEY Yes.

8 CHAIRMAN BOLLWERK: That is
9 obviously an important matter. Now, it may --
10 if he did something, then the question would
11 be, does that have anything to do with the map
12 that we are talking about generating.

13 If it doesn't, it may be
14 irrelevant. If it does, then it could have,
15 obviously, significance.

16 But, assuming that kind of
17 question can be answered appropriately, then
18 we would go ahead and allow him, as we said,
19 to put it on the screen, allow him to see --
20 so you can see what he is doing, go ahead and
21 generate the map.

22 We will take a look at it. The
23 intervenors, I think, have committed to going
24 ahead and pdf'g that and getting around
25 everybody immediately.

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1 We can go ahead and mark it with a
2 -- we can identify it -- mark it with a number
3 and identify it, but we will not admit it
4 until seven days have passed and you all have
5 that opportunity to say anything further you
6 want about that potential exhibit.

7 MR. PUGSLEY Okay. Thank you for
8 the clarification. I appreciate it.

9 CHAIRMAN BOLLWERK: Is that clear
10 to everyone? Have I -- any questions from the
11 joint intervenors?

12 MR. FETTUS: No, Your Honor.

13 CHAIRMAN BOLLWERK: Any questions
14 from Dr. Larson to that?

15 MR. LARSON: I think I understand.

16 CHAIRMAN BOLLWERK: I think we
17 told you that what -- what we are going to be
18 looking to you if there are any questions
19 about it.

20 So -- obviously, you are going to
21 give us a truthful answer, so -- all right.

22 Yes.

23 MR. HARPER: No questions, Your
24 Honor.

25 CHAIRMAN BOLLWERK: No questions.

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1 All right. Very good.

2 All right. Then, let's go ahead,
3 then, and move forward. And, just as a
4 planning matter, we are sort of hoping -- it
5 is now right at eleven o'clock. We are sort
6 of hoping to finish this whole -- this
7 Contention before lunchtime, and take our
8 lunch break at that point.

9 Hopefully, then, we can assess
10 where we are at in terms of the additional
11 contention the rest of the day, tomorrow, and
12 we will talk about that at that point.

13 Let's see what time -- how long it
14 takes to get -- to finish with this
15 contention.

16 All right. So, Dr. Larson, we
17 need to -- we have sworn you in. You have two
18 pieces of testimony that we need to deal with.

19 You have JTI002, which is your
20 statement of professional qualifications,
21 which is dated August 25th, 2014.

22 MR. CRYSTAL: Excuse me, Your
23 Honor. He is JTI004.

24 CHAIRMAN BOLLWERK: I am sorry.
25 JTI00 -- okay. JTI003-R is his testimony.

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1 Correct? I am sorry.

2 MR. CRYSTAL: Correct.

3 CHAIRMAN BOLLWERK: Which is the
4 testimony of Lance Larson dated August 25th,
5 2014. And also JTI004, which is the statement
6 of professional qualifications of Lance
7 Larson, dated August 25th, 2014.

8 Those relate to both Contentions 2
9 and 3, but we will admit it now and at that
10 point, when we get to Contention 3, then that
11 will have already been taken care of.

12 So, let me ask you one question
13 about that testimony. Was this testimony
14 prepared by you and under your supervision and
15 direction, and is it true and correct, to the
16 best of your knowledge and belief?

17 MR. LARSON: Yes.

18 CHAIRMAN BOLLWERK: Thank you.

19 MR. CRYSTAL: Your Honor.

20 CHAIRMAN BOLLWERK: Yes.

21 MR. CRYSTAL: I would just also
22 add at JTI052-R, it is his rebuttal testimony.

23 CHAIRMAN BOLLWERK: Right.

24 MR. CRYSTAL: Which falls in the
25 same category.

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1 CHAIRMAN BOLLWERK: Let's go ahead
2 and identify that for the record as described
3 by counsel and it is JTI052, which is the
4 prefiled rebuttal testimony of Lance -- Dr.
5 Lance Larson.

6 And let me ask you the same
7 question. Is this testimony prepared by you
8 or under your supervision and direction, and
9 is it true and correct to the best of your
10 knowledge and belief?

11 MR. LARSON: Yes.

12 CHAIRMAN BOLLWERK: All right.
13 So, we have identified for the record JTI003-
14 R, JTI004, and JTI052-R. All right.

15 (Whereupon, the above-referred-to
16 documents were marked as JTI Exhibits Nos.
17 003-R, 004 and 052-R for identification.)

18 Let's go then go through and take
19 care of the evidentiary material that supports
20 those documents.

21 At this point, for purposes of the
22 record, although you are going to be refileing
23 JTI005A-R, as R-2 when you take the exhibit --
24 the cover pages off, I am going to go ahead
25 and mark it for identification, just so we

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1 have a document that we know in the record
2 that we are all referring to.

3 And when we -- when you have gone
4 ahead and refiled that, then we will deal with
5 actually marking -- identifying it and putting
6 it into evidence.

7 But, at this moment we will simply
8 mark it for identification. It is not going
9 to be evidentiary, but it does give us -- it
10 is going to have exactly the same screenshots
11 in it and that is something that we can refer
12 to now, rather than having to wait for that
13 exhibit to be refiled.

14 MR. CRYSTAL: Your Honor, just for
15 clarification --

16 CHAIRMAN BOLLWERK: Sure.

17 MR. CRYSTAL: -- that is JTI005B-
18 R, right, not A-R?

19 CHAIRMAN BOLLWERK: Both.

20 MR. CRYSTAL: Okay.

21 CHAIRMAN BOLLWERK: We will only
22 going to be dealing with R, because both of
23 them have URL's on the front page.

24 MR. CRYSTAL: Right. Thank you.

25 CHAIRMAN BOLLWERK: Right. And it

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1 will be R-2 in both instances. Okay.

2 So, for purposes of
3 identification, JTI005A-R and JTI005B-R are
4 being marked for identification.

5 (Whereupon, the above-referred-to
6 documents were marked as JTI Exhibits Nos.
7 005A-R and 005B-R for identification.)

8 CHAIRMAN BOLLWERK: Also, let's
9 see, we -- your Contention 1 -- let me just
10 slip through here really quickly. And I will
11 rely on Counsel to let me know when I get to
12 the right one.

13 The next one I have for Contention
14 2 is JTI029.

15 MR. CRYSTAL: Yes.

16 CHAIRMAN BOLLWERK: All right.
17 Exhibit JTI029, it is from the Energy -- the
18 Energy Information Administration, Office of
19 Coal, Nuclear, Electric and Alternate Fuels of
20 the Department of Energy, a report
21 decommissioning of US Uranium Production
22 Facilities, DOE/EIAO-0592 from February of
23 1995.

24 JTI030. It is an NRC document,
25 Technical Basis for Assessing Uranium

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1 Bioremediation Performance from the Office of
2 Nuclear Regulatory Research, NRC -- I am
3 sorry. Is that a NUREG, do you think, or is
4 it a new -- it is NUREC. Is that something
5 recent --

6 MR. CRYSTAL: I don't think so.

7 CHAIRMAN BOLLWERK: In any event,
8 NUREC/CR-6973, August 2008.

9 JTI031, Western Water Consultants,
10 Incorporated Assessment Restoration
11 Activities, Sundance Project, January 22nd, of
12 1982.

13 JTI032, Nubeth Joint Venture
14 Environmental Report Supporting Information to
15 Application for Source Material License In
16 Situ Solution Mining Test Site, Sundance
17 Project, Crook County, Wyoming, 1976.

18 JTI003, an NRC Document, NRC
19 Staff's Response to NRDC and Powder River
20 Basin Research Council's Joint Motion to
21 Migrate and/or Amend Contentions and to
22 Admit New Contentions in Response to Staff's
23 FSEIS -- I am sorry. FSDEIS, April 14th,
24 2014.

25 JTI034, which is the NRC's Final

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1 Environmental Impact, Final Environmental
2 Statement Related to the Operation of the --
3 of the Irigaray -- no, that is not it.

4 MR. CRYSTAL: It is Irigaray.

5 CHAIRMAN BOLLWERK: Irigaray
6 Uranium Solution Mining Project, NUREG-0481,
7 September 1978.

8 And, JTI035, a Technical
9 Evaluation Report from the Christensen Ranch
10 Mine Units 2 and 6, Restoration Report of
11 October 23rd, 2012.

12 Skipping over, then, to JTI037,
13 that is a document by -- authored by W.F.
14 Keamey, the Director, SHE, Uranium One,
15 American's Permit to Mine Number 478 for the
16 Christensen Ranch Mine Project Unit 5, dated
17 May 10th of 2012.

18 JTI038, which is a document
19 authored by Tim McCullough, Manager Site SHE,
20 for Uranium One USA, for the Willow Creek ISR
21 Project, dated April 15th, 2014.

22 JTI039, which is authored by
23 Intera. It is an Application for Alternative
24 Concentration Limits for the Smith Ranch,
25 Highland Mine Unit B In Situ Uranium Recovery

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1 Facility in Converse County, Wyoming, dated
2 May 22nd, 2013.

3 Skipping forward, then, to JTI053,
4 which is Crowe Butte Resources Mine Unit 1
5 Restoration Report, January 2000, a Violation
6 History.

7 JTI054, which is the License SUA-
8 1341, Docket No. 40-8502, the Willow Creek
9 Project Quarterly Progress Report of the
10 Monitor Wells on Exclusion Status Second
11 Quarter 2012.

12 JTI055-R, which is the -- the
13 Irigaray and Christensen Ranch Environmental
14 Monitoring Station Locations.

15 JTI056, which is License SUA-1341,
16 Docket No. 40-8502, the Willow Creek Project,
17 Mine Unit 2-6, Groundwater Restoration.

18 (Whereupon, the above-referred-to
19 documents were marked as JTI Exhibits Nos.
20 029, 030, 031, 032, 003, 034, 035, 037, 038,
21 039, 053, 054, 055-R and 056 for
22 identification.)

23 CHAIRMAN BOLLWERK: And I believe
24 that is all your Contention 2 exhibits.

25 MR. CRYSTAL: I believe so, Your

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1 Honor.

2 CHAIRMAN BOLLWERK: Is that
3 correct? Okay. Those are all marked for
4 identification.

5 All right. So, now we are going
6 to admit into evidence the following exhibits.
7 JTI003-R, JTI004, JTI029, JTI030, JTI031,
8 JTI032, JTI033, JTI034, JTI035, JTI037,
9 JTI038, JTI039, JTI052-R, JTI053, JTI054,
10 JTI055-R, JTI056, and I think that is it.

11 (Whereupon, the above-referred-to
12 documents were received into evidence as JTI
13 Exhibits Nos. JTI003-R, JTI004, JTI029,
14 JTI030, JTI031, JTI032, JTI033, JTI034,
15 JTI035, JTI037, JTI038, JTI039, JTI052-R,
16 JTI053, JTI054, JTI055-R, JTI056.)

17 CHAIRMAN BOLLWERK: All right.
18 So, with that, Dr. Larson will now -- we are
19 now going to talk to you. Thank you for your
20 patience, sir.

21 And I think Judge White has some
22 questions.

23 JUDGE WHITE: I do have a few
24 questions. It appears, in reading your
25 prefiled written testimony and rebuttal

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1 testimony, as well as prefiled testimony and
2 rebuttal testimony from staff witnesses, at
3 least from my perspective, there seems to be
4 a difference of opinion about what constitutes
5 success in restoring groundwater quality after
6 the completion of ISR uranium mining.

7 And it is not a question, because
8 I -- I know you would agree with that.

9 Understanding that you are not a
10 lawyer, because I am really not looking for
11 legal arguments from you. I am not a lawyer,
12 either, but in your testimony, in writing your
13 testimony when you are referring to success or
14 not success, has it been your assumption that
15 any groundwater restoration effort that does
16 not return all dissolved contaminants to or
17 below premining baseline concentration is
18 unsuccessful?

19 DR. LARSON: I would have to say
20 that, with respect to successful or
21 unsuccessful, I think the disagreement would
22 come more in with how they are characterizing
23 those impacts.

24 Whereas they are saying that those
25 impacts are small with respect to getting up

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1 to some sort of potential ACL, I think that
2 the data shows that that is contradictory to
3 those impacts.

4 So, -- so, I -- the idea of
5 successful or unsuccessful is -- we can judge
6 it by, you know, primary, secondary or ACL's,
7 but the disagreement comes fundamentally with
8 respect to how they are characterizing those
9 impacts to the groundwater.

10 JUDGE WHITE: Okay. Thank you.

11 It is sort of a canned question,
12 but you do acknowledge, however, that current
13 regulations allow NRC to set alternate
14 standards for groundwater restoration if
15 reasonable efforts are not successful to meet
16 premining baseline concentrations.

17 And so that is, in effect, not
18 really your primary concern. Your primary
19 concern is with this designation of small --
20 of impact level?

21 DR. LARSON: I think my -- my
22 primary concern is how we quantify some of
23 those impacts, and so, you know, we have the
24 data to do some of those analyses and look at
25 some of that data, and so that is kind of what

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1 my testimony is hoping to support and to show.

2 JUDGE WHITE: All right. It is,
3 perhaps, a somewhat trivial thing that I
4 wanted to clear up, in your rebuttal
5 testimony, JTI052-R on page two, you state, "A
6 likelihood of meeting either the original
7 baseline or the EPA maximum contamination
8 limit for uranium is vanishingly small, do you
9 know or can you tell me what the current EPA
10 MCL for uranium is?

11 DR. LARSON: I believe it is 30
12 micrograms per liter.

13 JUDGE WHITE: I see. From your
14 review of the existing background data at the
15 Ross site, does the groundwater presently meet
16 those MCL's?

17 DR. LARSON: The background data
18 has not been collected by us.

19 JUDGE WHITE: Well, there is some
20 data available for the groundwater quality at
21 the site, at the Ross site.

22 DR. LARSON: How -- you are saying
23 that those values that were collected
24 prelicensing --

25 JUDGE WHITE: That is correct.

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1 DR. LARSON: -- would be compared
2 to --

3 JUDGE WHITE: However you would --
4 would -- just, given the values that are out
5 there that you know of.

6 DR. LARSON: So, some of the
7 testimony earlier throughout this hearing has
8 suggested that the prelicensing data wasn't
9 used for collected -- it wasn't collected to
10 assess restoration standards and goals.

11 JUDGE WHITE: No, I understand
12 that. I am just saying that from -- from the
13 data available, what we know about the
14 concentration of uranium in the groundwater
15 within the OZ aquifer right now, do those
16 values meet or exceed MCL for uranium?

17 DR. LARSON: I believe there are a
18 couple that do.

19 JUDGE WHITE: A couple -- a couple
20 exceed and a couple --

21 DR. LARSON: Don't.

22 JUDGE WHITE: -- are --

23 DR. LARSON: Yes. It varies.

24 JUDGE WHITE: Some above, some
25 below.

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1 DR. LARSON: Correct.

2 JUDGE WHITE: All right. So,
3 certainly for those that are already above
4 that, it would seem highly unlikely that you
5 could ever restore it to -- to below MCL for
6 uranium.

7 DR. LARSON: And that is where the
8 secondary standards would come in.

9 JUDGE WHITE: Yes. Yes. And
10 again, this is sort of a speculative question.
11 I am not asking you as for any legal advice,
12 but just to get a sense of what you are
13 thinking about with regards to what is success
14 and what isn't success.

15 Assuming you have read NRC
16 guidance regarding the standards required for
17 finding that the concentration of a
18 contaminant is as low as reasonably
19 achievable, and will not pose a substantial
20 present or potential hazard to human health or
21 the environment, do you agree that those
22 standards are adequate as they have been
23 referred to by staff witnesses?

24 Or, if not, do you think there
25 should be some other set of standards that are

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1 used to establish one or the other of those
2 benchmarks?

3 DR. LARSON: Do you mean
4 benchmarks with respect to primary/secondary
5 ACL's?

6 JUDGE WHITE: No. Benchmarks with
7 respect to the definition of protective of
8 human health and the environment.

9 I mean, my understanding is ACL's
10 are established, but they must be established
11 so that the values in the ACL's meet these two
12 criteria, the as low as reasonably achievable
13 and protective of human health and the
14 environment.

15 And you have heard staff witnesses
16 make reference to documents that -- that they
17 rely on for making those decisions about
18 whether something is protective or is not
19 protective.

20 And my question to you is, are
21 those documents sufficient -- is that
22 documentation sufficient or, in your opinion,
23 should there be some other set or some other
24 definition for protective of human health and
25 the environment?

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1 DR. LARSON: I would have to
2 review that document to know exactly what
3 those standards and what those methods are to
4 determine those.

5 JUDGE WHITE: Okay. There was an
6 issue in the rebuttal testimony between you
7 and staff rebuttal witnesses regarding --
8 well, I will read this.

9 In your written testimony, JTI003-
10 R, page nine, answer 14, you state, "When the
11 average" -- and you emphasize "average," --
12 "restoration, postrestoration values are
13 compared to the average," and you underline
14 that word in that part of the sentence as
15 well, "baseline," and you put quotations marks
16 around "baseline."

17 -- "the percent increased for
18 postrestoration average uranium values (range
19 from) -- well, (109 to 2640 percent) are
20 greater than the values the NRC staff provided
21 in table four."

22 All right. So -- so here you are
23 saying that the average restoration/
24 postrestoration values, or the ratio, all
25 right, NRC staff rebuttal testimony came back

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1 at NRC-044-R, page 24, and their witnesses
2 stated that, "Averaging all of the
3 measurements taken from samples collected
4 during the groundwater sweep and during the
5 stability period, rather than using final
6 concentration for comparison against baseline,
7 as done by the staff, is not appropriate
8 because of the changing and improving nature
9 of the quality of groundwater undergoing
10 restoration."

11 And I guess I would ask you if
12 staff is correct, that the quality of
13 groundwater used in this data set showed
14 improvement with time and, second, if so, why
15 is -- is your method a better method to assess
16 this than the method staff has used?

17 DR. LARSON: With the limited data
18 set that we have available for Nubeth, that is
19 one method that we can use to analyze that
20 data.

21 And, as we will show later in my
22 testimony, and looking at some of the
23 individual wells from other sites, we can see
24 that there are certain inconsistencies with
25 respect to some wells increasing, some wells

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1 decreasing.

2 So, we need to have a better
3 holistic look at the data that is presented
4 with some of these sites.

5 JUDGE WHITE: Okay. So you are --
6 you do not agree with the statement that --
7 that the data -- that all of the wells would
8 show a decreasing concentration over time?

9 DR. LARSON: I believe the wells
10 were elevated from baseline conditions.

11 JUDGE WHITE: Right now I have
12 only one other question and that is, given
13 that the issue here appears to be the lack of
14 success in restoration following the
15 completion of ISL mining operations.

16 In your opinion, is -- is there
17 current technology that exists that could be
18 used to improve those restoration results that
19 is not being used today?

20 DR. LARSON: There is a report, a
21 technical report that came out with respect to
22 some new tertiary methods of looking into how
23 to analyze it and how to look into some of
24 these new methods that are coming to
25 potentially be used for ISL operations.

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1 I think the amount of data that we
2 have specifically for ISL operations in
3 groundwater remediations sites, using these
4 technologies is -- it is in its infancy.

5 So, I think it is really early to
6 say whether these restoration methods can be
7 beneficial in the future. However, I think,
8 with more research and looking into some of
9 these different technologies, they show some
10 promising.

11 MR. PUGSLEY: Your Honor, is it --
12 that report an exhibit?

13 CHAIRMAN BOLLWERK: I am sorry?
14 Is there --

15 MR. PUGSLEY: Is that report that
16 was just referenced an exhibit?

17 CHAIRMAN BOLLWERK: Is it an
18 exhibit?

19 DR. LARSON: I believe so.

20 CHAIRMAN BOLLWERK: Okay. If you
21 can give us the number that would be -- we
22 would appreciate that.

23 DR. LARSON: It is under
24 Contention 3. It is JTI060.

25 CHAIRMAN BOLLWERK: Okay. If you

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1 -- let's see. 060. One second here.

2 If you want, we can go ahead and
3 admit that now or we can wait till -- I think
4 it is something we are going to talk a little
5 bit about, or is it --

6 MR. FETTUS: No. That answers my
7 question.

8 CHAIRMAN BOLLWERK: But if your
9 preference is to admit it now, we certainly
10 can do that, so --

11 MR. PUGSLEY: If it is pertaining
12 to Contention 3, Your Honor, I have no
13 objection to waiting until then.

14 CHAIRMAN BOLLWERK: All right.

15 MR. HARPER: We have no objection
16 as well, Your Honor.

17 CHAIRMAN BOLLWERK: All right.

18 JUDGE WHITE: Well, that is -- I
19 thank you. That is -- those are the questions
20 that I have up till now.

21 I guess I check with Judge Cole.

22 CHAIRMAN BOLLWERK: We should.

23 Judge Cole, do you have any
24 questions for the joint intervenor witness for
25 Contention 2?

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1 JUDGE COLE: I -- it still has to
2 do with the -- Dr. Larson's allegation that
3 there is risk to human health from radium and
4 uranium concentrations within the injected
5 aquifer. And I have a series of questions
6 concerning that.

7 CHAIRMAN BOLLWERK: All right.

8 JUDGE COLE: The first one, is --
9 Dr. Larson, did you state in 84 of your
10 rebuttal testimony that, in neither the FSEIS
11 or in the staff's August testimony is there a
12 risk of those calculations and supports a
13 contention that the elevated radium 226 and
14 uranium concentrations pose no threat to human
15 health and the environment? Last paragraph.

16 Now, isn't it true that uranium
17 ISR will only take place within that exempted
18 aquifer

19 DR. LARSON: That is correct.

20 JUDGE COLE: And do you disagree
21 that, in order to inject the aquifer, EPA and
22 WDEQ determined that the aquifer does not now,
23 and is not anticipated in the future to serve
24 as a drinking water source?

25 DR. LARSON: I believe that is the

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1 standards that EPA uses to accept an aquifer.

2 JUDGE COLE: Isn't it true that
3 the exempt aquifer, exempted portion of the
4 aquifer has been permanently exempted from
5 classification as an underground source of
6 drinking water? Permanently exempted.

7 DR. LARSON: From my
8 understanding, I -- of EPA's exemption, I
9 would have to review, but it is -- that sounds
10 correct.

11 JUDGE COLE: Now, do you disagree
12 that there are no domestic wells within the
13 entire license area and that historical
14 groundwater use has been limited to industrial
15 and livestock use?

16 DR. LARSON: That is my
17 understanding.

18 JUDGE COLE: And further, do you
19 disagree that there are no livestock wells
20 completely within the injected aquifer?

21 DR. LARSON: Could you clarify --
22 we were talking about the Crowe Butte in my
23 testimony. Are you talking about the Ross
24 site or the Crowe Butte site?

25 JUDGE COLE: I am talking about

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1 the -- on this site.

2 CHAIRMAN BOLLWERK: The Ross site
3 is on this site I think is what he said.

4 The Ross site, correct?

5 JUDGE COLE: Yes.

6 DR. LARSON: He is referring to my
7 testimony where I was discussing the Crowe
8 Butte site.

9 JUDGE COLE: Okay. That was the
10 -- that was the intervenor's Exhibit 009A,
11 page 189, the second to the last paragraph.
12 Does that refer only to Crowe Butte?

13 DR. LARSON: I believe so.

14 JUDGE COLE: Do you know if it is
15 true --

16 MR. CRYSTAL: Could we clarify
17 what exhibit we are talking about? We don't
18 have a 9A.

19 CHAIRMAN BOLLWERK: Judge Cole,
20 can you give us the exhibit number again,
21 please.

22 JUDGE COLE: Sure. It is Exhibit
23 SEI009A, and on page nine, second to the last
24 paragraph.

25 CHAIRMAN BOLLWERK: Okay. That is

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1 from the FSEIS.

2 JUDGE COLE: So that pertains to
3 this site, doesn't it?

4 CHAIRMAN BOLLWERK: We are getting
5 the document up. Give us one second here.

6 Okay. Can you see the document
7 that we have up on the screen?

8 JUDGE COLE: I am having trouble
9 reading it.

10 CHAIRMAN BOLLWERK: I just want to
11 make sure it is the right document.

12 JUDGE COLE: I am going to get the
13 secretary, the last part of the identified --
14 it a highlighted paragraph. Most of the
15 groundwater is represented in 349 have been
16 cancelled or are no longer active. Now, what
17 does that pertain to, the -- the livestock
18 wells.

19 CHAIRMAN BOLLWERK: And so, you are
20 interested in the last sentence of that
21 paragraph and, again, what is the question,
22 just so I am sure we are all on the same page?

23 JUDGE COLE: Does he agree that
24 there are no livestock wells -- do you agree
25 or disagree that there are no livestock wells

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1 completed within the exempted aquifer?

2 DR. LARSON: I guess I would have
3 to review where those wells are located.

4 JUDGE COLE: Okay. Let's go on to
5 the next question.

6 Do you disagree with NRC staff's
7 rebuttal testimony that states that the WDEQ-
8 proposed and EPA-approved reclassification of
9 groundwater within the mine unit, the Class V
10 Mineral Commercial, Industrial use?

11 That is Exhibit NRC044, at 12,
12 second paragraph.

13 CHAIRMAN BOLLWERK: Yes. It is
14 044R. It has been revised but, yes, you got
15 it.

16 DR. LARSON: Your Honor, could you
17 repeat the question? I am not --

18 CHAIRMAN BOLLWERK: Put the
19 exhibit up and then we will have it --

20 DR. LARSON: I am not sure what --

21 JUDGE COLE: Do you disagree with
22 NRC staff rebuttal testimony that states WDEQ
23 proposed and EPA approved reclassifications of
24 groundwater within the mine unit, a Class V
25 Mineral, Commercial?

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1 DR. LARSON: No, I do not.

2 JUDGE COLE: Do you not agree with
3 that?

4 DR. LARSON: I do not disagree
5 with that.

6 JUDGE COLE: Okay. You agree with
7 that?

8 DR. LARSON: That is incorrect. I
9 do not agree.

10 CHAIRMAN BOLLWERK: Wait. I think
11 we are -- I think we are confused now. Let --
12 let's take the question one more time.

13 JUDGE COLE: Okay. Do you
14 disagree with NRC's staff rebuttal testimony
15 that states WDEQ proposed and EPA approved
16 reclassification of groundwater within the
17 mine unit in (Aquifer exemption boundaries),
18 to Class V Mineral, Commercial, references
19 industrial use? And that exhibit, NRC044, I
20 guess it is R, at the 12 second, second
21 paragraph?

22 DR. LARSON: No.

23 JUDGE COLE: Okay. Do you
24 disagree that Strata will be required to
25 comply with Federal Regulation in 10 CFR 40,

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1 Appendix A, Criteria 5(b) to ensure compliance
2 with the groundwater protection standards that
3 are protective of human health and
4 environment, as stated in SEI009A and at page
5 585?

6 DR. LARSON: Your Honor, I -- I
7 don't have a -- I can't make an opinion on a
8 -- a technical opinion on the licensee's
9 conditions.

10 JUDGE COLE: Well, what would they
11 be required to do?

12 CHAIRMAN BOLLWERK: Your answer is
13 the same thing, that you are not --

14 DR. LARSON: It is the same thing.
15 I have no -- I can't --

16 CHAIRMAN BOLLWERK: All right.

17 JUDGE COLE: If there are no
18 drinking water wells within the exempted
19 aquifer or, indeed, within the entire license
20 area, there are no livestock wells within the
21 exempted aquifer and groundwater will meet the
22 Federal Standards protective of human health
23 and the environment, at the point of
24 compliance, which is the aquifer adjacent
25 boundary, where would the dose of radium 226

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1 and uranium in groundwater occur?

2 DR. LARSON: Your Honor, the data
3 that I presented show that the groundwater
4 essentially changes from one state before the
5 mining occurred to a significantly different
6 state once it was -- once it was -- the mining
7 was completed and restorations were completed.

8 And, by "state," I mean, as --
9 with respect to quantifying concentrations of
10 certain constituents in that water.

11 JUDGE COLE: But there are no
12 drinking water wells within the exempted
13 aquifer, and drinking water wells will not be
14 permitted in the exempted aquifer. Am I
15 correct?

16 DR. LARSON: That is my
17 understanding.

18 JUDGE COLE: Now, where would the
19 dose of radium 226 and uranium in groundwater
20 occur?

21 DR. LARSON: Your Honor, this --
22 this gets into a larger issue with respect to
23 potentially some of this stuff moving off-
24 site. That would probably be more associated
25 with fluid migration. That is Contention 3.

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1 JUDGE COLE: Okay. Thank you.

2 CHAIRMAN BOLLWERK: Judge White,
3 do you have anything further at this point?

4 JUDGE WHITE: No. I agree with
5 you that those are issues that I plan to
6 cover, as well, and we will look forward to
7 your testimony on that in Contention 3.

8 CHAIRMAN BOLLWERK: All right. At
9 this point I don't have any questions. Let's
10 look to the parties. Do you need several
11 minutes to talk about proposed cross-
12 examination questions?

13 MR. PUGSLEY: Your Honor, ten
14 minutes for us would be sufficient.

15 MR. HARPER: We agree.

16 MR. FETTUS: Ten minutes is fine.

17 CHAIRMAN BOLLWERK: Ten minutes.
18 All right. Let's take a ten-minute break,
19 then, and we will come back and see if there
20 is any proposed cross-examination questions.

21 (Whereupon, the above-entitled
22 matter went off the record at 11:36 a.m. and
23 resumed at 11:52 a.m.)

24 CHAIRMAN BOLLWERK: On the record.
25 We received some questions. We're going to

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1 talk with Judge Cole about these. It's a
2 scheduling matter. Just so you know when we
3 finish with the cross examination questions
4 for Dr. Larson, the individual ones, we then
5 will be impaneling all the witnesses for
6 Contention 2 and asking them some questions.
7 Just so you're aware and have folks around,
8 that will be what we have next.

9 At this point, we'll take a brief
10 recess and we'll be right back. Off the
11 record.

12 (Whereupon, the above-entitled
13 matter went off the record at 11:36 a.m. and
14 resumed at 12:08 p.m.)

15 CHAIRMAN BOLLWERK: Can we go on
16 the record please.

17 Dr. Larson, we have a couple of
18 additional questions to ask you. Are you
19 aware of any existing NRC licensees that have
20 attempted to follow the proposed bio-
21 restoration methods similar to those discussed
22 in JTI-60 which is the one that hasn't been
23 admitted into evidence? As you pointed out,
24 this was in the record.

25 DR. LARSON: Are you asking if

1 anyone has been required to try these methods?

2 CHAIRMAN BOLLWERK: No. I'll
3 restate the question again.

4 DR. LARSON: Okay.

5 CHAIRMAN BOLLWERK: Are you aware
6 of any existing NRC licensees that have
7 attempted to follow the proposed bio-
8 restoration methods similar to those discussed
9 in JTI-60?

10 DR. LARSON: I believe there have
11 been attempts to use it.

12 CHAIRMAN BOLLWERK: Okay. And do
13 you know what level of success they've had?

14 DR. LARSON: I think it's mixed.
15 And I would have to look into more of the data
16 and see more of exactly where they tried these
17 projects.

18 CHAIRMAN BOLLWERK: So you don't
19 know any of the details.

20 DR. LARSON: I don't know the
21 quantitative details. I can't tell you how
22 successful these projects have been.

23 CHAIRMAN BOLLWERK: Okay.

24 DR. LARSON: I know they've been
25 attempted and all that I've heard about them

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1 is that they're mixed review or mixed results.

2 CHAIRMAN BOLLWERK: Okay. Can you
3 envision a site that has an ACL and -- Put it
4 this way. Do you think that restoration to an
5 ACL at any ISR site would constitute a large
6 impact?

7 DR. LARSON: I think that would
8 depend on what the ACL is and what sort of
9 modeling program that's been in place and what
10 sort of data that we can collect to show and
11 demonstrate and prove quantitatively that that
12 material is not moving offsite. However, I
13 don't believe that's been done.

14 CHAIRMAN BOLLWERK: Okay. You
15 were asked whether you believe there are ways
16 to further improve restoration at ISL uranium
17 sites. Doesn't your testimony assume that
18 companies are using the available restoration
19 methods and complying with NRC Criteria 5B?

20 DR. LARSON: Throughout the
21 majority of my testimony, I've used the
22 proposed methods for groundwater restoration
23 that has been proposed for raw sites with
24 sites that have used similar methods with
25 respect to progressions, the methods used.

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1 And I demonstrated that using -- I know those
2 methods and under those conditions that the
3 data that I presented showed the values of
4 certain constituents, namely uranium, are
5 substantially elevated beyond pre-mining
6 conditions.

7 CHAIRMAN BOLLWERK: Does your
8 testimony then go to the likely impacts in the
9 mine aquifer post restoration?

10 DR. LARSON: Repeat the question
11 please.

12 CHAIRMAN BOLLWERK: Certainly.
13 Does your testimony go to the likely impacts
14 in the mine aquifer post restoration?

15 DR. LARSON: Yes. My testimony
16 shows how that aquifer changes with respect to
17 post restoration.

18 CHAIRMAN BOLLWERK: And do those
19 impacts exist irrespective of the potential
20 use of the aquifer for human or other
21 consumption?

22 DR. LARSON: Correct.

23 CHAIRMAN BOLLWERK: All right.
24 Anything further?

25 JUDGE WHITE: Nothing.

1 CHAIRMAN BOLLWERK: Judge Cole, do
2 you have anything?

3 JUDGE COLE: No.

4 CHAIRMAN BOLLWERK: All right. At
5 this point, I think we'd like to have all the
6 witnesses for Contention 2 come up and take a
7 seat. And just let me ask the court reporter.
8 Do you want me to have them identify
9 themselves or are you good? All right.

10 I think probably all of you were
11 here yesterday when we had the panel and some
12 of you were on the panel that we had. So I
13 think you have a sense of how this works.

14 One thing I should mention that I
15 didn't do yesterday and I will be direct about
16 enforcing today is the comments that you're
17 making are to the Board. So you should direct
18 all your statements to us, not to each other.

19 If you have something that you
20 want clarified or you think something ought to
21 be asked of another witness, certainly let us
22 know that and we'll go from there. But we're
23 trying to get -- Let me put it this way. We'd
24 like to have your discussion, but the
25 discussion should be directed to us and not to

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1 each other necessarily.

2 Obviously, when you're answering
3 our questions, everyone is hearing it and it
4 will work that way. So that won't be an
5 issue.

6 Before I start, again I'm going to
7 be looking at the rebuttal testimony and some
8 of the things that were in that. But let me
9 ask one question of the staff just as an
10 introductory matter for my information.

11 You've put what's been described
12 as a bounding analysis into this environmental
13 impact statement. Is this something -- We
14 talked about this yesterday with respect to
15 another item -- that's unique to the Ross SEIS
16 or is this something that's now going to be
17 incorporated into other NRC FEISes related to
18 other ISR projects?

19 MS. MOORE: Your Honor, we added
20 the bounding analysis in response to the
21 contentions that were raised against the
22 license application and the draft FEIS. And
23 because of that, I don't expect necessarily
24 that that sort of analysis would need to be
25 included in a future final SEIS or draft SEIS

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1 unless there was a similar issue raised.

2 Each SEIS is site specific and
3 there can be differences for each that may be
4 based on the characteristics of the site and
5 also differences that can be due based on the
6 input from the stakeholders during scoping or
7 in a hearing or comments on the draft. We
8 found that the information that was in the
9 GEIS was sufficient to allow us to come to an
10 impact conclusion regarding impacts due to an
11 ACL. That information was only added to
12 satisfy stakeholder interest.

13 CHAIRMAN BOLLWERK: Okay. Thank
14 you. All right. So what I'd like to talk
15 about a little bit is my questions are going
16 to be directed initially to the staff. And
17 I'd like to get your response to Dr. Larson's
18 answer to his rebuttal question four. I
19 believe that's JTI-051 or 052 if I remember.

20 MR. PUGSLEY: 052R.

21 CHAIRMAN BOLLWERK: 052, okay.
22 That's the basic document we'll be using. In
23 that question, he talks about both the Crow
24 Butte and the Smith Ranch facilities. And
25 with respect to Crow Butte, there's a

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1 statement that "Despite roughly equivalent
2 uranium concentrations observed previously
3 which were deemed not protected, the NRC
4 approved restoration as adequately protective
5 without SEIS explanation of the basis for
6 finding similar concentration limits
7 protective in one instance and not in
8 another." I want to see if the staff has any
9 comments on that.

10 DR. JOHNSON: Yes, Judge Bollwerk.
11 In the first instance, the finding of --

12 CHAIRMAN BOLLWERK: Make sure the
13 microphone is right down by your mouth.

14 DR. JOHNSON: Excuse me.

15 CHAIRMAN BOLLWERK: It's actually
16 probably right at your nose. There we go.
17 Perfect. Thank you.

18 DR. JOHNSON: Thank you, Judge
19 Bollwerk. In the first instance, the finding
20 of not being able to ensure that it was
21 protective was the fact that there was some
22 suggestion that it had not reached, the
23 concentration had not reached, a stable level.
24 So there was some concern that over time the
25 concentrations would slowly increase.

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1 Therefore, the finding of that
2 being protective was not possible because
3 there was concern that it would increase to
4 some unknown level in the future. And then
5 the requirement to address that was some
6 stability monitoring.

7 And the stability monitoring
8 showed that indeed, that concentration, those
9 concentrations were stable over time.
10 Therefore the analyses could be done to
11 determine if that would be protective outside
12 that exempted aquifer and indeed it was.

13 CHAIRMAN BOLLWERK: All right.
14 Dr. Larson, anything you want to say in
15 response to that?

16 DR. LARSON: No.

17 CHAIRMAN BOLLWERK: All right.
18 Anything anyone from Strata has in that
19 regard?

20 (No verbal response.)

21 No. All right.

22 Then again with respect to Crow
23 Butte, there's a statement that indicates that
24 the approval of the Crow Butte Unit 1
25 concentration levels of 18 times background as

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1 protective of human health and in the
2 environment was an arbitrary standard that
3 lacked any scientific or empirical basis and
4 had little meaning for future alternate
5 concentration levels at the raw site.
6 Anything the staff wants to say about that
7 observation.

8 DR. JOHNSON: Yes, Judge Bollwerk.
9 That finding was the finding that came out of
10 the NRC staff's review of the aquifer
11 restoration request. As preparing of the SEIS
12 we didn't reevaluate those findings. We
13 accepted them as this was the decision that
14 was made for accepting restoration at that
15 time. And I'd have to go back and redouble
16 check this.

17 But in their practice, NRC staff's
18 practice, in looking at that, it's that they
19 evaluated generally the kind of the transport
20 that would go on from the location within the
21 protection area out to that exempted boundary,
22 the boundary of the exempted aquifer.

23 In addition to which this was the
24 secondly standard developed by the state of --
25 in Crow Butte's case -- Nebraska in their UIC

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1 permit. And the assumption was that if this
2 was the standard that they were bound by then
3 that would be protective of outside of the
4 production area.

5 CHAIRMAN BOLLWERK: All right.
6 Dr. Larson.

7 DR. LARSON: I am familiar with a
8 transport model that's been proposed for the
9 Crow Butte project. And so if NRC staff could
10 provide the model that they used, that would
11 be helpful as well.

12 CHAIRMAN BOLLWERK: All right. So
13 you're saying without the model you don't
14 really have -- don't want to say anything
15 further.

16 DR. LARSON: Yes. And I think
17 without understanding saying that it's not
18 transporting without a transport model it's
19 unclear.

20 DR. JOHNSON: Judge Bollwerk.

21 CHAIRMAN BOLLWERK: Anything
22 further the staff wants to say?

23 DR. JOHNSON: The documents that
24 led to that aquifer approval are in our
25 exhibits. And all of the analyses and the

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1 evaluation that was done by NRC staff at that
2 time are included in those exhibits.

3 CHAIRMAN BOLLWERK: All right.
4 Anything further, Dr. Larson?

5 DR. LARSON: No.

6 CHAIRMAN BOLLWERK: Anything from
7 SEI? No, all right.

8 The second facility that's talked
9 about in Question 4 is the Smith Ranch
10 facility. And I was wondering if the staff
11 could provide any response that they might
12 have relative to the analysis about the
13 histogram that's on page seven of the
14 rebuttal. And again, that's JTI052 is the
15 number and it's Bates seven.

16 DR. JOHNSON: Judge Bollwerk.

17 CHAIRMAN BOLLWERK: Yes.

18 DR. JOHNSON: This histogram is a
19 very nice depiction of the fact that the
20 aquifer approval was essentially the ACL's.
21 As Mr. Saxton explained, at the time there
22 wasn't precisely the ACL that are the
23 regulatory practice today. But they
24 essentially served as ACLs.

25 What this histogram showed was the

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1 reason for and the consequence of the ACLs.
2 In other words, there were -- I think there is
3 a number of samples at a certain concentration
4 level, but it shows that a number of samples
5 exceeded the baseline. He compares it to
6 baseline at the time of aquifer restoration
7 approval.

8 CHAIRMAN BOLLWERK: All right.
9 And so you described this very nicely. I
10 don't think you have any problems with a
11 histogram.

12 DR. JOHNSON: No. I think it
13 demonstrates very clearly the situation that
14 there was the equivalent an ACL for -- In
15 fact, that's not quite true. There wasn't an
16 equivalent of an ACL for uranium because
17 uranium met the Class 1 domestic standard in
18 Wyoming at that time.

19 But if you strip away the
20 regulatory requirements there and you just
21 simply look at the concentrations -- the
22 concentrations in those wells the way it's
23 depicted here as samples -- there were more of
24 them that exceeded the baseline after
25 restoration than before ACL activities. And

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1 this situation was considered directly in the
2 analyses that we did for the FEIS, the
3 supplemental environmental impact statement.

4 This really captures the situation
5 that exists when the fourth 12:23:45 option
6 for meeting the regulatory criteria in 5(b)(5)
7 is requested. In other words, this is the
8 situation that would be there when an ACL
9 would be requested for a particular
10 constituent. In this case, that would be
11 uranium. This is the situation. So this just
12 demonstrates, it illustrates, the situation
13 that would be suitable for a request for an
14 ACL.

15 CHAIRMAN BOLLWERK: All right.
16 Dr. Larson, anything you want to say about the
17 histogram or your testimony relative to it
18 given what you heard here?

19 DR. LARSON: The histogram is a
20 cumulative distribution of data with respect
21 to baseline and post restoration samples.

22 CHAIRMAN BOLLWERK: All right.
23 Anything further you have on that?

24 JUDGE WHITE: Just for curiosity
25 sake, I believe we heard that -- Is it correct

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1 that 0.03 is the MCL for drinking water?

2 MR. SAXTON: That's correct.

3 JUDGE WHITE: So on this graph we
4 would see at least part of that baseline lies
5 under that value. Certainly none of the
6 restoration lies under that value.

7 MR. SAXTON: Sure.

8 JUDGE WHITE: I just wondered if
9 there's any comment that either staff or you
10 would make. I mean, does that mean that
11 people could have been drinking that water
12 before the mining and may have been drinking
13 that water before the mining? Then they were
14 not going to be able to drink the water after
15 the mining? I mean that's my sort of simple
16 minded interpretation of that.

17 MR. SAXTON: They wouldn't be able
18 to get an exempted aquifer if people were
19 drinking the water.

20 JUDGE WHITE: So the exempted
21 aquifer regardless of some of the wells in
22 fact met MCL people still wouldn't have been
23 told.

24 MR. SAXTON: Whether or not it
25 meets an MCL is not part of the criteria for

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1 --

2 JUDGE WHITE: An exempted act.

3 MR. SAXTON: It's whether or not
4 it is used now or in the future or it has
5 mineralization. Those are the criteria.

6 JUDGE WHITE: Yes. I understand
7 that. So the idea of an exempted aquifer is
8 it's exempted because of the fact that it has
9 potential for economic exportation.

10 MR. SAXTON: That's correct. And
11 I haven't reviewed all the data, but I assume
12 that it's correct for the distribution data.
13 One of the problems is that for radium that's
14 generally all above the MCLs, a lot of the
15 well fields. So not only do you have to look
16 at uranium, you look at radium as well because
17 that's another radiological that's always
18 prohibitive as a drinking water source.

19 JUDGE WHITE: Thank you.

20 CHAIRMAN BOLLWERK: Dr. Larson,
21 anything further you want to say about the
22 histogram?

23 DR. LARSON: No.

24 CHAIRMAN BOLLWERK: All right.
25 The next question I have goes to -- again

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1 looking for a response from the staff at least
2 initially -- question five on the same
3 rebuttal testimony from Dr. Larson. And there
4 is a couple of different things. I want to
5 take them one at a time.

6 The first would be the point that
7 he makes about net uranium flux as an
8 explanation for decreased uranium
9 concentrations per the Borch study.

10 DR. JOHNSON: Your Honor.

11 CHAIRMAN BOLLWERK: Yes.

12 DR. JOHNSON: I think that this
13 would be helpful in responding to this to have
14 this document, a certain page of it, on the
15 big screen.

16 CHAIRMAN BOLLWERK: We're
17 hopefully doing that right now.

18 DR. JOHNSON: Oh, excuse me. This
19 is 037. And I believe NRC037.

20 CHAIRMAN BOLLWERK: By document,
21 you mean the Borch study?

22 DR. JOHNSON: Yes.

23 CHAIRMAN BOLLWERK: I'm sorry. I
24 misunderstood.

25 DR. JOHNSON: And if you'd go to

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1 the second to the last page and above the
2 acknowledgments, the third paragraph up.

3 CHAIRMAN BOLLWERK: The one that
4 starts "There is potential..."

5 DR. JOHNSON: The paragraph begins
6 by "The very low concentrations of target
7 species..."

8 CHAIRMAN BOLLWERK: All right.

9 DR. JOHNSON: Okay. "Uranium and
10 radium ..." This is the paragraph that was
11 reflected in the NRC staff's testimony. And
12 it's rather straightforward. It strikes me
13 that "the very low concentrations of target
14 species, uranium and radium, at the two
15 monitoring wells indicate that natural
16 attenuation is likely to play a major role at
17 the mobilizing residual, i.e., after
18 remediation, concentrations of uranium-6
19 species, thus preventing them from moving
20 outside the mined area."

21 That was the conclusion that the
22 staff summarized in the testimony. And, to
23 add a little bit more understanding to that
24 point, it might be good to go to page four of
25 the document, the figure, just past the

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1 figure. Right there. If you could blow it up
2 to make sure we can see it.

3 If I may, I'd just like to explain
4 really what this is about. The squares with
5 the dots is a portion of the wellfield
6 patterns. At the time restoration was
7 approved, there were two wells, MP4 and
8 another one, MP5, which really isn't the
9 subject here.

10 But those were production wells.
11 They have the highest levels of uranium that
12 existed in that wellfield at the time
13 restoration was approved.

14 The next well -- that has a scale
15 on it. You can see what 200 feet is. So the
16 estimated distance between MP4 and I21 is
17 about 150 feet. I21, I stands for injection.
18 Those were injection wells. That was the edge
19 of the production wellfield pattern.

20 LTM is a long-term monitoring well
21 that was put in to monitor a post aquifer
22 restoration approval. M3 and M4 were
23 monitoring wells that were in the parameter
24 monitoring ring.

25 The data that Borch interprets is

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1 data that was collected from 2005 to 2012 by
2 the licensee, Cameco, and submitted to the
3 state agency. And the concern was since MP4
4 had a high level of uranium at the time that
5 the aquifer restoration was approved they
6 wanted to determine whether the predictions of
7 natural attenuation would hold through time
8 which would then prevent any migration out of
9 that exempted aquifer.

10 We got seven years of data for
11 those wells. The statistical analyses done by
12 Borch in MP4 showed that over that period of
13 time there was an increase of about 4.4
14 percent in uranium concentration.

15 But I21 which is 150 feet down
16 gradient the uranium concentration in that
17 well started out much lower than at MP4. It
18 declined 30 percent over those eight years.
19 I'm going to read my numbers just to make
20 sure. Yes, 30 percent over those eight years.

21 LTM, the long-term monitoring well
22 4 and M3 and M4 which are in the parameter
23 monitoring wells, they started out being less
24 than the MCL for uranium which is 0.03
25 milligram per liter. And after 12 years, they

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1 were still below the MCL and they showed no
2 statistical indication of a declining
3 concentration or an inclining concentration
4 increasing.

5 So it was based upon the numbers,
6 the volumes measured in LTM for M3 and M4 that
7 Borch was referring to when he made that
8 statement supporting natural attenuation in
9 his conclusion section that the staff then
10 took and used it in the testimony.

11 CHAIRMAN BOLLWERK: All right.
12 Dr. Larson, anything you'd like to say?

13 DR. LARSON: Yes. As I already
14 said in my rebuttal which was up previously,
15 those interpretations had been taken out of
16 context. If you look at what they said in the
17 actual report that the concentration, the
18 decreasing concentrations, of I21 could be due
19 to either natural attenuation mechanisms or to
20 net uranium flux leaving the well. That means
21 it could be either sequestered into the
22 aquifer itself or transporting offsite and
23 that's why it was decreasing.

24 Furthermore, he goes on to state
25 that they really can't establish an idea for

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1 which one of these it could be because of the
2 lack of hydrological and biogeochemical data
3 -- I'm paraphrasing -- that's available for
4 him.

5 And even if you look at this
6 figure, we don't have any sort of idea with
7 respect to potential natural flow in this
8 aquifer. All we have is an estimated flow
9 direction. If we had that potential natural
10 surface data, we could make better predictions
11 with respect to where the groundwater was
12 actually flowing, if it actually was flowing
13 from west to east. We don't really know.

14 That's one of the concerns that
15 the Borch paper was referring to. So that's
16 where my rebuttal testimony was referring to
17 with respect to this question.

18 CHAIRMAN BOLLWERK: All right.

19 JUDGE WHITE: The alternative to
20 natural attenuation was uranium flux. Could
21 you tell us what you mean by that?

22 DR. LARSON: Yes. So uranium
23 would be leaving with the groundwater flow.

24 CHAIRMAN BOLLWERK: Would staff
25 like to respond?

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1 DR. JOHNSON: Yes. I just want to
2 be clear that the staff's testimony did not
3 purport to explain the decline of 30 percent
4 over those years for I21. Our testimony was
5 specific to those monitoring wells. That's
6 very clear that the Borch suggests that that's
7 from natural attenuation.

8 CHAIRMAN BOLLWERK: All right.
9 Dr. Larson? Do you need a second to find
10 something?

11 DR. LARSON: Well, I was going to
12 what I was in my testimony responding to with
13 respect to what they had said in their initial
14 testimony. I can cite that if you'd like.

15 CHAIRMAN BOLLWERK: Okay.

16 DR. LARSON: For the record, it's
17 in the staff's initial at that Q2. tab?

18 CHAIRMAN BOLLWERK: All right.
19 Anything further the staff has on this point?
20 No.

21 All right. Judge Cole, at any
22 point if you need to chime in, just let us
23 know. All right?

24 JUDGE COLE: Okay.

25 CHAIRMAN BOLLWERK: The second

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1 part of this, again the same question,
2 rebuttal question five dealing with the Smith
3 Ranch. Maybe not. The second part of
4 rebuttal question five, I'd like the staff's
5 response to the portion of Dr. Larson's answer
6 that talks about the lack of staff bounding
7 analysis discussion, the trend toward
8 increasing uranium concentration in the ore
9 zone such as for the Smith Highland Mine Unit
10 A and the Christianson Mine Unit 5-2 to
11 support a finding of small and temporary
12 impact versus large and permanent impacts. If
13 you need a second to look at the testimony,
14 you should do that.

15 DR. JOHNSON: Yes.

16 CHAIRMAN BOLLWERK: It's question
17 five. I don't have a page. Unfortunately, I
18 didn't write that down.

19 DR. JOHNSON: Judge Bollwerk, I
20 can response to that.

21 CHAIRMAN BOLLWERK: Okay.

22 DR. JOHNSON: And this really is I
23 guess a couple things. One is that I can't
24 speak for the Christianson Ranch because that
25 aquifer restoration has not been approved.

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1 But in terms of the wellfield A at
2 Smith Ranch, the regulations that we follow
3 are as that the concentrations that exist of
4 the constituents in the production area and
5 exempted aquifer need to be protective at the
6 point of compliance which is the boundary of
7 the exempt aquifer into the underground
8 sources of drinking water.

9 Now it was determined by the NRC
10 staff at the time of aquifer restoration that
11 the concentrations that remained were
12 protective. And that situation then allows us
13 to follow the impact analyses that were first
14 established in the generic environment impact
15 statement and tiered into the SEIS for the
16 Ross project of being small. It's just as
17 straightforward as that.

18 CHAIRMAN BOLLWERK: All right.
19 Anything further you want to say on this, Dr.
20 Larson?

21 DR. LARSON: I'm just quoting what
22 the data says.

23 CHAIRMAN BOLLWERK: All right.

24 Judge White, anything further?

25 Okay.

1 Just a couple more. First, this
2 one I would like the staff's response to Dr.
3 Larson's answer to rebuttal question six that
4 the Irigaray Mine Units 9-2 concentrations who
5 the actual range of increase from average
6 baseline of between 16 and 125 times, thereby
7 exceeding the staff's proposed upper and lower
8 bounding levels of four and 71 times which
9 shows how this bounding analysis does not
10 provide a meaningful range of baseline values
11 or ultimate concentration limits.

12 DR. JOHNSON: Judge Bollwerk.

13 CHAIRMAN BOLLWERK: Yes.

14 DR. JOHNSON: Could you help me on
15 the page you're at? Who did you read from?

16 CHAIRMAN BOLLWERK: Let's see. I
17 would need see -- Hold on one second here.
18 Let me see if I can find it.

19 MR. HARPER: It's immediately
20 before 11.

21 MR. FETUS: Eleven and 12.

22 CHAIRMAN BOLLWERK: Eleven and 12,
23 thank you.

24 DR. JOHNSON: Excuse me. And
25 could you, Judge Bollwerk, explain where on

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1 that page you were reading from?

2 CHAIRMAN BOLLWERK: Could you
3 bring it down to like 75 or maybe 100 so that
4 I can see the whole page? It's page 12.

5 MR. HARPER: It's on page 12
6 immediately before that beginning of question
7 seven.

8 CHAIRMAN BOLLWERK: Question seven
9 is right there. You need to come down this
10 way. There we go.

11 DR. JOHNSON: So do I understand
12 correctly that it's the last part to the last
13 paragraph that starts with "However"? Is that
14 the paragraph that you'd like us to address?

15 CHAIRMAN BOLLWERK: Right. Yes.

16 DR. JOHNSON: Okay. I'll try to
17 take a stab at this and if I'm missing the
18 target.

19 CHAIRMAN BOLLWERK: Right. Again,
20 if you need to take a second to read it over,
21 I'd like for you to read it than try to shoot
22 from the hip as it were. Do the best that you
23 can anyway.

24 DR. JOHNSON: This situation goes
25 back to the approach taken for establishing

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1 the equivalent of the ACL at that time and of
2 the averaging mine units 1-9. And they looked
3 at that as a whole and established an ACL,
4 equivalent of an ACL, for the whole. This was
5 based upon average concentrations.

6 Now the premise of this rebuttal
7 testimony is that mine unit one was
8 anomalously, the uranium concentrations were
9 higher than in mine units 2-9. And therefore
10 if you strip away mine unit one and set that
11 aside and then reevaluate what the ACL would
12 have looked like in mine units 2-9, they would
13 have generated that the concentration units,
14 the 1.46, 3.8 and the average baseline
15 increase from 16 times to 125 times.

16 That may be the case. I don't
17 know. I didn't do the calculations. As I
18 believe it is stated pretty clearly in our
19 testimony for this analyses we took the
20 aquifer restoration approvals as they existed
21 and we didn't reanalyze and re-evaluate and
22 second guess those approvals. So we did not
23 do the calculations of how this would have
24 looked if the aquifer restoration would have
25 been done differently.

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1 And that's what this is. This is
2 assuming that the aquifer restoration would
3 have been differently and had broken it apart
4 in different fashion.

5 It goes back to the concept of
6 averaging whether averaging wells in a
7 particular mine unit or wellfield. Or in this
8 case, they're averaging mine units. Every
9 time there's an average you've got some that
10 are higher and some that are lower.

11 This is an attempt to redo that
12 aquifer restoration. And that's not the
13 situation at hand. The aquifer restoration
14 that was approved is just what it is.

15 CHAIRMAN BOLLWERK: Right. Dr.
16 Larson.

17 DR. LARSON: So the point I was
18 trying to make was that I'm not trying to
19 second guess or redo. What I'm saying was and
20 I've documented this well throughout the
21 majority of my testimony of the issues
22 associated with the research and development
23 activities in irrigated mining which skewed
24 the concentrations for baseline with respect
25 to all the mining when they are all

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1 collectively put together.

2 If we can circumvent that issue
3 and look at the data behind those other mine
4 units that weren't affected by research and
5 development activities, we can actually get an
6 idea of what the impacts to those individual
7 mine units were. Based upon that data, those
8 relationships between baseline for each mine
9 unit and post restoration concentrations range
10 between 16 times to 125 times.

11 CHAIRMAN BOLLWERK: All right.
12 Judge White, anything? No. All right.

13 One last question at least from me
14 anyway. I'd like to get the staff's response
15 to Dr. Larson's answer in again rebuttal
16 question six that disputes the staff's
17 assertion that the Irigaray site has no
18 relevance to the Ross site operation. And
19 that was further up I guess if I've got the
20 right rebuttal question. I hope I did.

21 DR. JOHNSON: Judge Bollwerk.

22 CHAIRMAN BOLLWERK: Yes.

23 DR. JOHNSON: That's rather
24 straightforward. And that simply put is not
25 an approved aquifer restoration. The licensee

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1 submitted some materials on that and the NRC
2 staff did the review. In fact, Mr. Saxton
3 here can talk about that in greater detail.

4 But they asked for additional
5 information. And therefore it's not an
6 approved restoration. So the analyses that
7 was done for the final SEIS was simply based
8 upon those where the aquifer restoration had
9 been approved.

10 CHAIRMAN BOLLWERK: All right.
11 Anything further the staff wants to say before
12 I turn it over to Dr. Larson?

13 MR. SAXTON: Can you rephrase the
14 question? Did you say Crystal Ranch?

15 CHAIRMAN BOLLWERK: No, I believe
16 it's -- Hold on one second here.

17 DR. JOHNSON: Excuse me. I
18 misunderstood. I'm sorry.

19 CHAIRMAN BOLLWERK: It was the
20 Irigaray site I think. Do I have that
21 correct, Dr. Larson?

22 DR. LARSON: Irigaray is my
23 understanding.

24 CHAIRMAN BOLLWERK: Irigaray, I
25 keep mispronouncing it. But hopefully it will

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1 be spelled correctly on the record.

2 MR. FETUS: It's actually, Your
3 Honor, question seven.

4 CHAIRMAN BOLLWERK: Is it seven?
5 I apologize. I've got the wrong question
6 number.

7 DR. JOHNSON: Judge Bollwerk.

8 CHAIRMAN BOLLWERK: Yes.

9 DR. JOHNSON: I believe I
10 understand.

11 CHAIRMAN BOLLWERK: Okay. I'm
12 sorry about the question number. It didn't
13 help things any.

14 DR. JOHNSON: Yes, I think I was
15 mixed up anyway. But the staff testimony that
16 is being referred to in seven, Q7, and answer
17 seven is testimony from our A.2.11. And its
18 continuation of the point that I made just
19 previously and that is that there's no reason
20 for us to do a recalculation of Irigaray mine
21 units and considers units 2-9 and unit one
22 independently.

23 The measure that was evaluated for
24 aquifer restoration was whether it would be
25 protective. Those concentrations would be

1 protective at the boundary. And indeed that's
2 the finding that was made by the NRC staff of
3 the aquifer restoration. There was no reason
4 to go in and try to redo and second guess the
5 staff's decision at that time.

6 Now if the answer in seven then
7 brings this in to the Nubeth for Ross
8 considering that Nubeth was indeed an R&D,
9 research and development, facility that
10 occurred some 30 years or more, 35 years,
11 prior. And there's differences.

12 Even though I'm not intimating
13 familiar with the research and development
14 activities in mine unit one for Irigaray,
15 there are differences in the one with Nubeth
16 because (1) we know that Nubeth was a very
17 small operation. And that's well documented.
18 (2) Also the pre-license site characterization
19 data that were developed by Strata that was
20 used for the Final SEIS establishes that there
21 isn't an impact from the Nubeth operations on
22 the situation today at the Ross site.

23 CHAIRMAN BOLLWERK: All right.
24 Dr. Larson, anything further you want to say
25 on this subject?

1 DR. LARSON: Just the point I was
2 making with this was respect to if you have
3 some sort of R&D activity located within a
4 proposed mine boundary. There is the
5 potential to have artificially elevated
6 concentrations of certain contaminants of
7 concern which would potentially result in a
8 situation similar that we saw at Irigaray
9 where we saw very high concentrations due to
10 research and development activities which
11 could potentially mask the groundwater
12 impacts. That was my concern with the Nubeth
13 operations with respect to what we've already
14 seen happen at another ISL site.

15 MR. SAXTON: Your Honor, if I
16 might.

17 CHAIRMAN BOLLWERK: Yes.

18 MR. SAXTON: I'm not intimating
19 familiar with all the studies that were done
20 in Irigaray. But it's my understanding that
21 it was a seven pattern site, a pilot site.
22 And they didn't get approved restoration
23 before they went into commercial. So that's
24 a big difference because Nubeth that have the
25 approved restoration.

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1 And, secondly is that even though
2 the answer in this indicated that ammonium
3 will not be different from carbonate-based
4 lixiviant. Past history has shown that that's
5 more troublesome than a regular carbonate-
6 based lixiviant.

7 CHAIRMAN BOLLWERK: Right. I'm
8 sorry.

9 DR. LARSON: So the thing I was
10 saying with respect to sodium carbonate
11 lixiviant which to any of the ISL sites that
12 have been shown in data throughout my
13 testimony on the commercial scale sites have
14 used sodium bicarbonate and the issues that
15 have arisen from that. I was making a point
16 that if you had elevated concentrations it
17 doesn't necessarily matter. We had issues
18 restoring either one of these.

19 CHAIRMAN BOLLWERK: All right.
20 Anything further from the staff at this point
21 or from -- Make sure you pull it down and get
22 it to your mouth. Thank you.

23 MS. MOORE: I just wanted to
24 reiterate a statement I made yesterday that
25 when we are considering the environmental

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1 impacts of the Ross project, we're considering
2 the impacts to the affected environment as
3 they exist today. And we are not attempting
4 to consider the impacts to the environment if
5 it had never been impacted by a previous
6 project. That's in the direct
7 impact section. But as I mentioned yesterday,
8 we do consider the impacts cumulatively in the
9 cumulative impact section.

10 CHAIRMAN BOLLWERK: All right.
11 Let me ask one question of the staff. Is
12 there anything you want to say about that, Dr.
13 Larson?

14 DR. LARSON: No.

15 CHAIRMAN BOLLWERK: All right. So
16 does the staff have a schedule for the
17 Christianson Mine in terms of making a ruling
18 on the pending restoration request?

19 MR. SAXTON: The short answer is
20 no. We've submitted something back to the
21 licensee for them to come back to us with more
22 or less a schedule. I met the project manager
23 of that particular site.

24 But in essence there were several
25 different mine units 2-6 and some of them were

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1 a little bit closer to meeting a restoration
2 standard than others. Then we went back into
3 one of them, mine unit 5, as has been reported
4 and they started operations back up there.
5 That one will not be submitted with the others
6 as they were before.

7 The short answer is I don't know
8 what the schedule is. Hopefully, we hope to
9 see some information about what we recommended
10 in our evaluation back in 2012.

11 CHAIRMAN BOLLWERK: Anything
12 further you have? Anything further anyone of
13 the panel wants to say anything about? All
14 right.

15 Judge Cole, do you have anything?
16 No.

17 MR. KNODE: Judge Bollwerk.

18 CHAIRMAN BOLLWERK: Yes.

19 MR. KNODE: Can I make a comment
20 please?

21 CHAIRMAN BOLLWERK: Sure.

22 MR. KNODE: Can we bring back up
23 NRC 037?

24 CHAIRMAN BOLLWERK: Okay, 037.

25 MR. KNODE: Can we go to the

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1 schematic of the wellfield that Dr. Jones --
2 Yes, thank you very much.

3 CHAIRMAN BOLLWERK: All right.

4 MR. KNODE: Maybe a little context
5 here. I was general manager of operations at
6 Cameco at the Highland mine at this time.
7 Restoration was then complied but there was
8 concern about regulatory agencies that their
9 plume would move out of underneath the
10 wellfield and it would move towards the open
11 pit which is there still today.

12 Clearly, you can see the direction
13 of flow as shown. And that goes right to the
14 pit. The thought was that mine 3 and 4 would
15 eventually pick up this path. It was going to
16 be in that direction and it did not attenuate.
17 But that's a long ways away from the
18 wellfield.

19 So we went with the regulators to
20 install well LTM4 to catch a plume if it was
21 moving away from the wellfield. And as Dr.
22 Johnson, I think, described, that did not
23 happen. And the uranium concentrations are as
24 she stated quite low.

25 And I would go back to what Dr.

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1 Johnson said earlier today. The proof is in
2 the pudding. Throughout the testimony there
3 are accusations of some large plume moving off
4 the lack of an absorptive, remember, were in
5 an exempted aquifer here.

6 The accusations are throughout
7 their testimony that this all is about to run
8 off out
9 of the aquifer exemption into the drinking
10 water sources and have a large impact. I
11 think this is a very good example of how that
12 is not going to happen. Thank you.

13 CHAIRMAN BOLLWERK: All right.
14 Dr. Larson, anything you want to say?

15 DR. LARSON: Just getting to the
16 point where if we actually look at the
17 estimated flow direction line it's an
18 estimated flow direction. So to properly
19 assess which way this groundwater is moving,
20 we would need further data with respect to
21 what a potential metric surface was for this
22 confining unit.

23 Getting to this idea where we've
24 made assertions of large contaminate plumes
25 moving offsite and getting into drinking

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1 water, I don't think that has been presented
2 in my testimony. The thing that we have
3 discussed over the majority of my testimony is
4 with respect to the potential for some of
5 these impacts to occur and where we can look
6 into assessing further data where we can
7 properly assess where those impacts might
8 occur.

9 CHAIRMAN BOLLWERK: All right.
10 Anything further the staff wants to say in
11 this regard or SEI?

12 MR. KNODE: Your Honor, there's
13 absolutely no question where the water is
14 going. There is a 500 foot deep open pit is
15 still recharging slowly. That water is going
16 straight to the pit and there cannot be
17 uranium flux. It has to be natural
18 attenuation.

19 CHAIRMAN BOLLWERK: Anything
20 further, Dr. Larson?

21 DR. LARSON: I think I need to see
22 further assessment data.

23 CHAIRMAN BOLLWERK: Right. Okay.
24 Judge White, anything that you have?

25 JUDGE WHITE: Nothing more from

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1 me.

2 CHAIRMAN BOLLWERK: All right.
3 Judge Cole, anything further?

4 JUDGE COLE: No.

5 CHAIRMAN BOLLWERK: I think that
6 was a no. Thank you. Anything the parties
7 want to propose in terms of questions?

8 MR. PUGSLEY: None, Your Honor.

9 DR. LARSON: None, Your Honor.

10 CHAIRMAN BOLLWERK: Nothing. All
11 right. At this point, we're going to dismiss
12 the panel for Contention II. We thank you all
13 very much for providing us with the
14 information. It's been very helpful both in
15 your individual testimony and your group
16 testimony.

17 JUDGE WHITE: Yes, thank you all.
18 Appreciate it.

19 CHAIRMAN BOLLWERK: Let's talk for
20 a second about scheduling. We're right at
21 1:00 p.m. We have one more contention to go.
22 This contention took us if we subtract the
23 portion at the beginning that we had to deal
24 with Contention 1 a little bit further about
25 four hours.

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1 The first question is how long
2 would you like to have for lunch. We can do
3 it in probably as little as half an hour or 45
4 minutes. But we'll defer to you all.

5 PARTICIPANT: Thirty minutes.

6 MS. MONTEITH: Can you clarify?
7 Was the question about how long for lunch?

8 CHAIRMAN BOLLWERK: Yes.

9 MS. MONTEITH: Oh, we can support
10 half an hour as short as that if that's okay.

11 MR. FETUS: Your Honor, we have to
12 go offsite.

13 CHAIRMAN BOLLWERK: Okay.

14 MR. FETUS: We don't actually have
15 staff.

16 CHAIRMAN BOLLWERK: Okay.

17 MS. ANDERSON: Your Honor, we also
18 would like some time to read.

19 CHAIRMAN BOLLWERK: All right. So
20 how long would like? An hour like yesterday?

21 MS. ANDERSON: Yes.

22 CHAIRMAN BOLLWERK: Okay. We'll
23 do an hour then. So we'll come back at 2:00
24 p.m. Then that puts us here at 2:00 p.m.

25 It took us about four hours to do

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1 Contention 2. Right, 2:00 p.m. So that's
2 6:00 p.m. Judge Cole has offered to stick
3 around if we think we're going to finish which
4 puts him at the 8:00 p.m.-9:00 p.m. range
5 depending on what time we get done. Are you
6 all willing to go to 6:00 p.m. or 7:00 p.m. to
7 finish this up?

8 (Chorus of yeses.)

9 CHAIRMAN BOLLWERK: Yes. I see a
10 lot of head nodding. Is that alright with
11 you, Judge Cole, if we're -- You said you
12 wanted to finish, right?

13 JUDGE COLE: Yes.

14 CHAIRMAN BOLLWERK: Yes, okay.
15 All right. Then the plan will be when we come
16 back, when we start, we're going to go until
17 the end. Hopefully, we'll be done by 6:00
18 p.m. or thereabouts. We'll see how long it
19 takes.

20 All right. Very good. I guess I
21 should mention one other thing. At the site
22 visit tomorrow, it sounds like if we're done
23 today that's a possibility I suppose.

24 MR. PUGSLEY: Let me defer to Mr.
25 Knode on that because he's been in contact

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1 with the Your Honor's folks.

2 MR. KNODE: I've been in touch
3 with Your Honor's personnel. They have not
4 gotten back to me yet.

5 CHAIRMAN BOLLWERK: Okay.

6 MR. KNODE: But I have alerted
7 them that we would likely want to try and have
8 a tour tomorrow.

9 CHAIRMAN BOLLWERK: Okay.

10 MR. KNODE: Can I get with you?

11 CHAIRMAN BOLLWERK: Yes. We'll
12 wait to hear from you whatever it is.

13 MR. KNODE: I just wanted to
14 confirm that we were actually going to finish
15 today.

16 CHAIRMAN BOLLWERK: That's fine.
17 Anybody again that wanted to go or was onboard
18 to go before would probably need to make sure
19 that they're still going and let Mr. Knode
20 know assuming it's going to come off.

21 Okay. We'll take our recess.
22 We'll come back at 2:00 p.m. Thank you. Off
23 the record.

24 (Whereupon, at 1:00 p.m., the
25 above-entitled matter recessed to return at

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1 2:01 p.m. the same day.)

2 CHAIRMAN BOLLWERK: On the record.
3 Good afternoon, everyone. We're here after
4 our lunch break to start on Contention 3. And
5 before we do just a couple of administrative
6 items.

7 I don't know how many of you had
8 met Maureen Conley who's with the Office of
9 Public Affairs from the NRC. But we heard
10 that her mother passed away. She was actually
11 headed to Chicago from here. We're certainly
12 sorry to hear about that. She's a very nice
13 person and we were glad to have her with the
14 Board to help us out with public affairs
15 matters. Sorry to hear about her loss.

16 I understand from the folks at SEI
17 that at least at this point subject to weather
18 the site visit for tomorrow is on, although it
19 looks like we're going to have to do the
20 vehicles somewhat differently. I think they
21 are going to provide a four-wheel drive
22 vehicle and the Board has at least one. So I
23 think we're going to try to do that rather
24 than the van.

25 We do need to know or they need to

1 know how many folks are still planning on
2 going to the site visit. For instance, I know
3 the Board had four and we still have four.

4 Does the staff know how many
5 individuals?

6 MS. MONTEITH: Four I believe.

7 CHAIRMAN BOLLWERK: Four, okay.
8 That's eight. How about the joint
9 intervenors?

10 MS. ANDERSON: Your Honor, I
11 believe it'll just be myself.

12 CHAIRMAN BOLLWERK: Just one. So
13 that's nine. And how many -- I guess does
14 that give you the information you need?

15 (Off microphone comment.)

16 Two. So that's 11. If we split
17 up like five and whatever -- five and six or
18 something like that.

19 MR. HARPER: Your Honor, the staff
20 also has a four wheel drive vehicle that we
21 can use to get out there.

22 CHAIRMAN BOLLWERK: Okay. We can
23 decide which one is the best one to take.
24 Who's got the best four wheel drive right?

25 (Off microphone comments.)

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1 Also the four wheel drive vehicles
2 we're driving are four wheel drive, but
3 they're not -- Think about that in any event.
4 That's the plan anyway.

5 At this point, subject to some
6 additional weather issues, and if there is
7 additional weather out there, that may still
8 require that we cancel. But it looks like the
9 trip is on. The same schedule would apply,
10 8:00 a.m. tomorrow morning, assuming we get
11 done tonight. We're certainly going to press
12 forward with that. Out at the Strata offices
13 and then we'll go from there.

14 Any questions anybody has? All
15 right.

16 I'm trying to think in terms of --
17 I think the only evidentiary issues we have
18 are you all are going to refile the two
19 exhibits. Was there anything else relative to
20 Contention 2 that I'm missing evidence-wise?
21 I don't think so.

22 All right. Let's move forward to
23 Contention 3. And following the protocol we
24 set up, we'll hear from each of the counsel
25 for approximately five minutes on their

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1 position relative to this contention. And
2 then we'll have the first panel come up from
3 SEI. All right.

4 CONTENTION 3

5 MR. PUGSLEY: Thank you, Your
6 Honor. With respect to Contention 3,
7 Intervenors have alleged that the FSEIS has
8 failed to include adequate information
9 regarding containment or recovery solutions
10 and potential impacts to groundwater. For
11 purposes of this contention, Strata will rely
12 on the expert testimony of Mr. Ray Moores, Mr.
13 Mike Griffin, Mr. Knode, Mr. Demuth, Mr.
14 Lawrence and Mr. Schiffer.

15 Strata respectfully submits to the
16 Board that its license application, subsequent
17 submissions and the entirety of NRC staff's
18 record of decision including the FSEIS
19 adequately comply with NUREG 15.69 guidance
20 which pursuant as stated before to Commission
21 precedent is to be accorded special weight and
22 deference and 10 CFR 51 NEPA requirements.

23 With respect to the legal aspects
24 of Contention 3, as a general matter, Chapter
25 5 of NUREG 15.69 specifically anticipates post

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1 license issuance development of a detailed
2 site-specific hydrogeological analysis within
3 the confines of a wellfield package, SEI015 at
4 license condition 11.5. License conditions
5 are currently in Strata's NRC license
6 requiring additional site specific
7 hydrogeological information post license
8 issuance. And that is the same exhibit at
9 license condition 10.13. This again is as
10 stated before consistent with the Commission's
11 policy on performance-based licensing.

12 As noted with respect to
13 Contention 1 as well, this approach is
14 directly endorsed in the Commission's decision
15 in CLI-06-01, 63 NRC 1 which is known as the
16 Hydro Resources case, and it specifically
17 identifies post license issuance development
18 of items such as wellfield packages, UCLs.

19 Specific points of contention
20 levied by Intervenors under Contention 3
21 include allegations that Strata will not be
22 able to monitor for and correct excursions due
23 to potential unplugged historical exploratory
24 bore holes or that Strata pump test did not
25 provide enough information for NRC staff to

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1 make an informed evaluation of potential
2 impacts.

3 With respect to excursion
4 monitoring and corrective action, NRC
5 regulations in Strata's license SEI015,
6 License Condition 11.5 on page 13,
7 specifically requires immediate corrective
8 action upon identification of an excursion.
9 And the Commission as a general matter does
10 not presume that a licensee will violate its
11 regulations or licensee's license conditions.
12 That is seen in the Private Fuel Storage case
13 at CLI-01-9.

14 The Licensing Board has been
15 provided with evidence in SEI026 at A.28 at
16 page 14, the expert testimony of Mr. Demuth
17 and Mr. Lawrence, that an excursion itself is
18 not a violation of regulatory requirements,
19 but rather it is an early warning of the
20 potential for migration of recovery solutions
21 outside the recovery zone.

22 Technically, the definition of an
23 excursion is an event where a monitor well in
24 an overlying or underlying where parameter
25 monitor well ring detects increased and

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1 identified and approved monitoring parameters
2 or UCLs which are selected based on their
3 ability to provide an early warning of
4 potential recovery solution migration because
5 they move at a substantially similar rate to
6 groundwater. This is typical practice at ISL
7 facilities and is expressly recognized both in
8 NUREG 15.69 and NUREG 19.10, otherwise known
9 as the Generic Environmental Impact Statement.

10 Strata's numerical gravel water
11 model also simulated in excursion from a Ross
12 wellfield using site-specific and conservative
13 characteristics and wellfield patterns as
14 shown in the SER and SEI014H at pages 142-160
15 and the SER itself, its conclusions have not
16 been and are not subject to challenge in this
17 proceeding.

18 Strata has already demonstrated
19 proficiency for identifying and plugging
20 historical bore holes. There are a total of
21 1,483 historic exploration bore holes in the
22 Ross license area. To date, Strata has
23 physically located 1,354 of these holes. So,
24 more importantly, 92 percent of historic bore
25 holes within the proposed monitor well rings

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1 have been physically located.

2 With respect to Strata's plans to
3 re-abandon historical bore holes, it is
4 generally understood and accepted practice
5 that ISL operators address such bore holes
6 through site-specific investigation, post
7 license issuance pump test, potentially metric
8 and water quality assessments after
9 installation of complete monitor well network
10 which is affected will detect an unplugged
11 bore hole that will be properly plugged
12 pursuant to license condition 10.12.

13 However, Strata has gone above and
14 beyond these typical requirements and has
15 committed at license condition 10.12 which
16 specifies that historic bore holes within the
17 perimeter monitor well rings will be properly
18 plugged and abandoned prior to conducting
19 wellfield scale aquifer tests.

20 With respect to allegations that
21 Strata's pump tests were too short in
22 duration, Strata has offered an NRC staff
23 evaluated seven pump test which serves to
24 satisfy applicable NUREG 15.69 requirements.
25 The pump test were of adequate duration to

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1 satisfy their intended purpose including
2 determining characterization of aquifer
3 hydrological properties and whether there is
4 communication between your zone and overlying
5 and underlying aquifers.

6 Mr. Moore's expert testimony in
7 SEI042 at page six shows that Strata located,
8 reentered and plugged all historical bore
9 holes near the 72 hour pump test. The results
10 confirmed hydrological isolation of the
11 recovery zone.

12 Strata also used additional data
13 such as water level differences in the SM and
14 OZ aquifers showing static water levels
15 measured at each well that shows several to
16 tens of feet of difference between the
17 aquifers. These water level differences along
18 with water quality differences demonstrate
19 hydrologic isolation.

20 Strata has committed per license
21 condition to conduct additional wellfield
22 scale pump tests to further assure adequate
23 hydrogeologic isolation. And without such a
24 demonstration, license ISL operations cannot
25 commence. Under Strata's NRC license, a

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1 wellfield package for the initial wellfield is
2 subject to review and verification license
3 condition and pre-operational inspection by
4 NRC staff. And subsequent wellfield packages
5 will be submitted to NRC and be available for
6 inspection consistent with the Commission
7 endorsed policy on performance-based
8 licensing.

9 Finally, Intervenors' witness, Dr.
10 Abitz, also raised in his rebuttal testimony
11 at JTI051R at A.14 the concept of preferential
12 groundwater flow paths. This issue was
13 addressed by NRC staff in SER-SEI010 at 86-87
14 and that SER has not been challenged in this
15 proceeding.

16 With that said and with the
17 testimony of our expert witnesses, we
18 respectfully submit to the Board that Strata's
19 NRC license and the record of decision should
20 not be modified as a result of any of the
21 substance of Contention 3. Thank you.

22 CHAIRMAN BOLLWERK: Thank you.

23 Staff then.

24 MS. MONTEITH: I just want to
25 check and see if I'm coming through on this

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1 microphone. I've been told I'm a little quiet
2 here.

3 CHAIRMAN BOLLWERK: How is that?

4 MS. MONTEITH: All right.

5 JUDGE COLE: I can hear you.

6 MS. MONTEITH: Great. Thank you.

7 The staff expert witnesses for
8 Contention 3 are John Saxton, Johari Moore and
9 Kathryn Johnson from whom you've heard today.
10 In addition, Dr. Anthony Burgess will be
11 joining the panel for Contention 3.

12 Dr. Burgess is a hydrogeologist,
13 an engineer with over 45 years experience in
14 this field. Dr. Burgess prepared the sections
15 that relate to groundwater issues.

16 In Contention 3 among other
17 issues, the Intervenors expressed concerns
18 regarding the existence of historic drill
19 holes located within the Ross project area and
20 the potential is pathways for vertical
21 excursions. As the staff explained in its
22 written testimony, the effects of historic
23 drill holes were taken into consideration and
24 evaluated by the staff in the FSEIS as
25 particularly in Sections 3.5.3.2 and 4.5.1.2

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1 of that document which I believe is SEI
2 Exhibit SEI 009A. The staff also inserted a
3 condition in Strata's license to address
4 historic drill holes. Strata's license
5 exhibit SEI015.

6 License condition 10.12 requires
7 Strata to attempt to locate and abandon all
8 historic drill holes within the well ring
9 perimeter prior to operation. Strata will
10 include information documenting its efforts in
11 the wellfield package.

12 In addition, Condition 10.13 of
13 the license requires that Strata submit the
14 wellfield package to the NRC for review and
15 verification. If, after review, the staff
16 determines that Strata failed to make a good
17 faith effort to abandon all drill holes within
18 the well ring perimeter the staff would not
19 concur on the wellfield package and would
20 notify Strata that commencing operations would
21 result in a violation of its license.

22 The Intervenor claim that the
23 staff is placing too much faith in Strata's
24 ability to locate and abandon these drill
25 holes characterizing license condition 10.12

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1 as little more than a promise that will be
2 left unfulfilled. This demonstrates a basic
3 misunderstanding of the nature of license
4 conditions. If Strata does not conform to the
5 conditions of its license, it will be subject
6 to enforcement action by the NRC.
7 Importantly, as the Commission stated in the
8 Private Fuel Storage case which is CLI-01-9,
9 the NRC does not operate under an assumption
10 that a licensee will violate its obligations.

11 In addition, the staff performed a
12 detailed review of Strata's methodology for
13 collecting the hydrological information used
14 to inform the staff's fluid migration impact
15 assessment. The staff determined that Strata
16 methodology including the types of pumping
17 tests used to collect hydrological data met
18 the guidance for such procedures in the
19 standard review plan. The staff also found
20 that the hydrological data developed as a
21 result of Strata's methodology conformed to
22 the acceptance criteria in the standard review
23 plan.

24 As I mentioned in my opening
25 statement yesterday concerning Contention 1,

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1 while the standard review plan as Commission
2 guidance is not directly binding on the Board,
3 the Commission has stated such guidance is
4 implicitly endorsed by the Commission and is
5 entitled to corresponding special weight.

6 Finally, the Intervenors
7 challenged the staff's analysis of the
8 geochemistry of the aquifers and has claimed
9 that the staff erred in failing to evaluate
10 uranium as an early excursion indicator. In
11 its pre-filed testimony, the staff described
12 why the manner in which uranium interacts with
13 the aquifer qualifies it as a poor early
14 excursion indicator. The point of the staff's
15 excursion indicator analysis performed in its
16 SER described in the FSEIS to establish which
17 parameter should be monitors as a leading
18 indicator to identify the excursion most
19 quickly.

20 As the staff discussed in its
21 written testimony, the excursion indicators
22 for the Ross project have little potential for
23 interfering chemical reactions that would
24 inhibit their movement through the aquifer.
25 It is for this reason that the staff did not

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1 evaluate uranium as an early excursion
2 indicator in the Ross project FSEIS.

3 In sum, the staff complied with
4 NEPA by thoroughly describing in the FSEIS the
5 likelihood of impact of fluid migration.
6 Thank you.

7 CHAIRMAN BOLLWERK: Thank you.

8 Let's hear now from the Joint
9 Intervenors.

10 MR. CRYSTAL: Thank you, Your
11 Honor. As to Contention 3, challenges by the
12 NRC has taken a hard look at the environmental
13 impacts associated with uranium or other
14 contaminants migrating beyond the areas in
15 monitoring well network. Our experts
16 demonstrate that SEI and staff's assertions
17 that there will be no such impacts are based
18 on several erroneous premises.

19 First, Dr. Abitz demonstrates that
20 the protests incorporated in the OS do not
21 demonstrate that the aquifer is confined. The
22 evidence will show that the duration of the
23 protests are not sufficient to demonstrate
24 confinement over an operational period of
25 seven years and it fully depends on the

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1 filling of over 1,000 bore holes.

2 Second, both Drs. Abitz and Larson
3 demonstrate the FEIS and ORC's assumption that
4 these bore holes will all be filled. They
5 explain that the vast difficulties in finding
6 and filling these holes. Both staff and SEI
7 urge the Board to assume that the bore holes
8 will all be filled, as we explained in our
9 pre-trial brief, citing several precedents.
10 It is not sufficient for an agency to simply
11 assert that it will mitigate environmental
12 impact without providing details to support
13 that assertion, details that are missing from
14 this EIS.

15 In none of this legal requirement,
16 the evidence will show that the EIS does not
17 adequately demonstrate that the bore holes
18 will filled.

19 Finally, because the NRC has
20 demonstrated neither that the aquifer's
21 confined nor that the bore holes will all be
22 filled, they have failed to address the likely
23 environmental impacts associated with
24 excursions. To the extent those were not
25 addressed at all, staff and SEI experts

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1 erroneously claim that any excursions will be
2 detected and addressed.

3 But as Drs. Abitz and Larson
4 explain, the simple sanctions made regarding
5 contaminant transport in an homogenous,
6 isotropic aquifer are insufficient to
7 demonstrate that excursions are likely at this
8 site as the NRC asserts.

9 In conclusion, Joint Intervenors
10 will demonstrate in Contention 3 that first,
11 assuming that the bore holes will filled;
12 second, assuming that the aquifer will be
13 confined; and third, assuming that any
14 excursions will be detected and resolved,
15 fails to take a hard look at the environmental
16 impacts of the project which must be disclosed
17 and taken into account in the NRC's decision
18 making. Therefore, as with Contentions 1 and
19 2, the Joint Intervenors respectfully request
20 that based on this contention the Board vacate
21 this SEI's license and ROD for staff to
22 complete EIS that fully complies with NEPA.
23 Thank you.

24 CHAIRMAN BOLLWERK: Thank you.
25 All right. We are ready now for the witnesses

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1 for SEI. And while they're coming forward,
2 I'm going to take one second here and read the
3 text of the contention into the record just so
4 it's clear to everybody what we're litigating.

5 This is Environmental Contention
6 3. The FSEIS fails to include adequate
7 hydrological information to demonstrate SEI's
8 ability to contain groundwater fluid
9 migration. And the contention states the
10 FSEIS fails to assess adequately the
11 likelihood and impacts of fluid migration to
12 the adjacent groundwater as required by 10 CFR
13 Sections 51.90-94 and NEPA and as discussed in
14 NUREG 15.69 Section 2.7. In that, (1) the
15 FSEIS fails to analyze sufficiently the
16 potential for and impacts associated with
17 fluid migration associated with unplugged
18 exploratory bore holes, including the adequacy
19 of Applicant's plan to mitigate possible bore
20 hole related migration impacts by monitoring
21 wellfields surrounding the bore holes and/or
22 plugging the bore holes; and (2) there was
23 insufficient information for the NRC staff to
24 make an informed fluid migration impact
25 assessment given that the Applicant's six

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1 monitor well clusters and 24 hour pump test
2 for these clusters provided insufficient
3 hydrological information to demonstrate
4 satisfactory groundwater control during
5 planned, high yield industrial raw operations.
6 That is Contention 3.

7 All right, gentlemen. Why don't
8 we have everyone identify themselves for the
9 record. And you need to pull the microphones
10 down in front of you because they are very
11 directional whichever one you're going to use.

12 MR. GRIFFIN: Mike Griffin,
13 Strata.

14 MR. DEMUTH: Hal Demuth, Texas
15 Tech.

16 MR. MOORES: Roy Moores, WWC
17 Engineering.

18 MR. KNODE: Ralph Knode, Strata.

19 MR. LAWRENCE: Errol Lawrence,
20 Petra Tech.

21 MR. SCHIFFER: Ben Schiffer, WWC
22 Engineering.

23 CHAIRMAN BOLLWERK: All right. I
24 believe for four of you we've already admitted
25 your testimony and sworn you in. So we need

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1 to swear in Mr. Griffin and Mr. Moores I
2 believe who have not previously been sworn in.

3 (Mr. Moores and Mr. Griffin sworn
4 in.)

5 Thank you very much. Then we're
6 going to be looking at both your initial
7 written testimony as well as your rebuttal
8 testimony. The initial testimony for Mr.
9 Griffin is SEI039 and Mr. Moores initial
10 testimony is SEI042. And then for Mr. Morris,
11 the rebuttal testimony is SEI048. Mr. Griffin
12 the rebuttal testimony is SEI049. And those
13 have been identified for the record.

14 (Whereupon, the above-
15 referred to documents
16 were marked as Exhibits
17 SEI039, SEI042, SEI048
18 and SEI049 for
19 identification.)

20 I would also ask each of you to
21 give me an oral response to the following
22 question. Was this testimony prepared by you
23 or under your supervision and direct? Is it
24 true and correct to the best of your knowledge
25 and belief?

1 MR. GRIFFIN: It is, Your Honor.

2 MR. MOORES: Yes, Your Honor.

3 CHAIRMAN BOLLWERK: All right.

4 Thank you very much. Then no objection to
5 that testimony, we will admit that with the
6 remaining Strata exhibits and let's go through
7 quickly and identify those and get them into
8 the record.

9 They include SEI040 which Mike
10 Griffin CV, SEI041 which is an August 19, 1999
11 NDEQ letter to Crow Butte, SEI043 which is Ray
12 Moores CV. SEI048 which is Ray Moores
13 Rebuttal testimony I've already identified
14 that. We'll skip that. We'll go to -- Sorry.

15 (Whereupon, the above-
16 referred to documents
17 were marked as Exhibits
18 SEI040, SEI041 and
19 S E I 0 4 3 f o r
20 identification.)

21 MR. PUGSLEY: I believe that's it.

22 CHAIRMAN BOLLWERK: You could be
23 right. It looks like that's it. Did I miss
24 anything? Are we good?

25 MR. PUGSLEY: No sir.

1 CHAIRMAN BOLLWERK: All right. So
2 those have been identified for the record.
3 Let's go ahead and admit them. We're
4 admitting into evidence SEI039, SEI040,
5 SEI041, SEI042, SEI043, SEI048 and SEI049,
6 again identified for the record and have been
7 admitted.

8 (Whereupon, the above-
9 referred to documents
10 m a r k e d f o r
11 i d e n t i f i c a t i o n a s
12 Exhibits SEI040-SEI043,
13 SEI048 and SEI049 were
14 received into evidence.)

15 Thank you very much. All right.
16 I think as we've been doing in the past Judge
17 White has some questions for you.

18 JUDGE WHITE: I do have a few.
19 Focusing on unplugged bore holes, Strata has
20 committed to plugging all of the bore holes
21 that can be located within the perimeter
22 monitoring well ring and beneath the central
23 plan. I believe that's correct. Is that?

24 MR. KNODE: That is correct.

25 JUDGE WHITE: Is there any

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1 distance or any reason that you would plug any
2 bore holes that might exist beyond the monitor
3 well ring?

4 MR. SCHIFFER: Judge, this is Ben
5 Schiffer. And I guess I'll take a first pass
6 at this. And I think it's key to understand
7 that the bore holes are primarily located
8 adjacent to the ore bodies. When we get very
9 far away from them, there really aren't very
10 many bore holes. I think that's critical to
11 understand. So that's really the reason.

12 And I think secondarily the reason
13 is that perimeter monitor well ring is the
14 point at which we could detect if there was
15 fluid migration that had gone past the
16 wellfield areas. And given the rigorous
17 monitoring that has to be done at this
18 perimeter monitor well rings and then the
19 general low number of holes that are beyond
20 that, there doesn't seem to any reason to go
21 to the effort to do that.

22 JUDGE WHITE: I see. So for the
23 most part, the fact that the commitment does
24 not extend beyond the perimeter monitoring
25 reflects your confidence that contaminant

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1 bearing solutions won't migrate past the
2 perimeter well ring during the course of
3 mining.

4 MR. SCHIFFER: That is correct,
5 Your Honor.

6 JUDGE COLE: Can I ask something
7 here?

8 CHAIRMAN BOLLWERK: Sure. Go
9 right ahead, Judge Cole.

10 JUDGE COLE: What's the constant -
11 - between the monitoring well and the well
12 system that you're using to take your reading?

13 MR. SCHIFFER: Judge Cole, the
14 perimeter monitor wells are offset from the
15 mining areas by a distance of 400 feet.

16 JUDGE COLE: So there are no
17 mining operation wells that are closer than
18 400 feet to the monitoring system?

19 MR. SCHIFFER: Let me be clear.
20 We can be closer with our mining activities to
21 those monitor wells. But we cannot be farther
22 away.

23 JUDGE COLE: Do you have any idea
24 how close you get to the well system?

25 MR. SCHIFFER: I think our

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1 preference would be that we stay at that 400
2 feet distance. That's the distance that was
3 modeled as part of the license application and
4 it demonstrates that we can easily detect an
5 excursion within the time frames required by
6 the regulations. And obviously if that
7 monitor well ring were closer to the principal
8 mining areas, we would detect those
9 perturbations much or sooner than we would at
10 400 feet.

11 JUDGE COLE: You're going 400 feet
12 did you say?

13 MR. SCHIFFER: Actually, I believe
14 with the State of Wyoming the distance can be
15 no more than 400 feet from our wellfield.

16 JUDGE COLE: The reason why I ask
17 if you could get closer is there might be
18 other wells that are past that and it might
19 within the detection distance.

20 MR. SCHIFFER: Judge Cole, I'm not
21 sure what other wells you may be referring to.

22 JUDGE COLE: Monitored wells.

23 JUDGE WHITE: Historical wells I
24 think he means.

25 MR. SCHIFFER: Judge Cole, there

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1 is a potential that there are bore holes that
2 are outside of the perimeter monitor well
3 ring. But as I indicated earlier, the density
4 of that drawing is substantially less just
5 because very likely there's no uranium there.

6 JUDGE COLE: Thank you.

7 CHAIRMAN BOLLWERK: Just so I
8 understand. What Judge Cole is raising is the
9 possibility that your monitoring well is like
10 350 feet away and there's an unplugged bore
11 hole at 400 feet which would normally be
12 inside but now is outside because of where the
13 monitoring well is. Is that the basic point?

14 MR. SCHIFFER: Yes. That's what
15 he's saying.

16 CHAIRMAN BOLLWERK: And you're
17 saying that's not going to occur or you're
18 saying there's real possibility it could
19 occur.

20 MR. SCHIFFER: No, I think that
21 possibility exists. Our requirement is to
22 plug those within the perimeter monitor well
23 ring.

24 CHAIRMAN BOLLWERK: So you're
25 going to basically draw a circle 400 feet

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1 around it and make sure you plug everything
2 that's within whether the monitor well is at
3 the boundary inside that ring.

4 MR. KNODE: We're going to draw a
5 circle around the outside of the active
6 wellfields that's 400 feet away from those
7 active wellfields.

8 CHAIRMAN BOLLWERK: Okay.

9 MR. KNODE: The perimeter monitor
10 wells will be along that line and we will plug
11 everything in sight of that line.

12 CHAIRMAN BOLLWERK: Okay. All
13 right.

14 JUDGE WHITE: Okay. In trying to
15 clear up some of these number regarding
16 historical bore holes, in the FSEIS, SEI009A,
17 page 316, next to last paragraph it states "As
18 of October 2010 the applicant had located 759
19 of the estimated 1,682 holes from Nubeth
20 exploration activities and it plugged 55 of
21 them." We heard counsel's statement that many
22 more of those have been plugged now.

23 But what I'd like to know is have
24 you first located additional Nubeth's holes
25 beyond that 1,682 and how many of the Nubeth

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1 holes have been plugged to date.

2 MR. KNODE: I'm not sure where the
3 1,682 comes from.

4 JUDGE WHITE: The 1,682 comes from
5 the FSEIS.

6 MR. KNODE: That's not just --
7 That's the Ross permit area plus a half mile
8 buffer outside.

9 JUDGE WHITE: Okay.

10 MR. KNODE: That's in addition.
11 That's larger than the Ross permit area.

12 JUDGE WHITE: Okay.

13 MR. KNODE: So inside the Ross
14 permit area, there's 1,483 wells. You're
15 correct initially that there were 625 that
16 were located. We have located an additional
17 729. So as my testimony reflects as of I
18 believe it was August of this year the total
19 number of located wells inside the Ross permit
20 area is 1,354.

21 So of the 1,483, we have found
22 1,354 to date. Of those 1,354, we have
23 plugged 108 or re-abandoned 108 of those.

24 JUDGE WHITE: How many of those
25 1,354 are inside the proposed perimeter ring?

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1 MR. KNODE: Well, what I need to
2 stress is that we do not know exactly where
3 that perimeter ring will be for all of the
4 mine units. So we can make an educated guess
5 how many. Inside the proposed or the
6 estimated boundaries of mine units 1, 2, 3 and
7 4, inside those monitor rings would be 1,382
8 wells of which 1,265 have been located.

9 And by located I think you saw on
10 the site tour, you saw an example of what
11 those look like. There's a cement cap with a
12 metal plug that has been located and
13 resurveyed.

14 JUDGE WHITE: And that goes to
15 emphasize a previous comment that the great
16 majority of the historical Nubeth holes are
17 going to be inside your perimeter well ring
18 anyway and not very many outside.

19 MR. KNODE: Correct.

20 JUDGE WHITE: Now I kept saying
21 Nubeth because that's what the FSEIS mentions
22 Nubeth. Are in fact all of the wells that
23 you've just mentioned that you've identified
24 and plugged historical wells from the two
25 Nubeth projects in the late 1970s?

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1 MR. KNODE: Yes, it's my
2 understanding that all those wells are
3 historic Nubeth expiration holes.

4 JUDGE WHITE: In Figure 3.2 of the
5 FSEIS on page 149, it shows that there are
6 also several abandoned petroleum bore holes.
7 I guess petroleum. I don't know if they are
8 oil or gas in the Ross area. To your
9 knowledge, are all the historical petroleum
10 within your perimeter ring been located and
11 properly plugged?

12 MR. SCHIFFER: Judge, this is Ben
13 Schiffer. And I can attest to that. As part
14 of the Class I UIC permit application that
15 Petro Tech compiled and we ultimately received
16 a permit for, they provided a detailed
17 assessment of the exploration of oil and gas.
18 And those tests that were conducted as well as
19 the plugging and abandonment of those were
20 from oil test wells so to speak that have been
21 done over time.

22 Yes, we have those data and they
23 have been submitted as part of a Class I UIC
24 application. And those data indicate that
25 those holes have been plugged and abandoned

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1 with cement.

2 JUDGE WHITE: So just to be sure
3 to get the statement, to your knowledge you
4 feel confident that there are no improperly
5 abandoned petroleum wells or unlocated
6 petroleum wells inside the perimeter well
7 ring.

8 MR. SCHIFFER: To our knowledge
9 there are no unplugged exploration for oil or
10 gas holes. And maybe Hal can elaborate on
11 that.

12 MR. DEMUTH: Yes, Judge. Hal
13 Demuth with Petro Tech. As Mr. Schiffer
14 alluded to, during the UIC permitting process
15 for Class I injection well, we had to provide
16 a very thorough review of the AOR, area of
17 review, for a potential Class I well. In this
18 case there are multiple wells planned for the
19 offsite. And they cover the vast majority in
20 terms of the area pressure influence that
21 would be exerted by the Class I wells.

22 And we had to evaluate not only
23 onsite but also offsite. That evaluation was
24 reviewed and approved by WDEQ and a Class I
25 permit issued. So I think we can state

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1 confidently that those wells have been
2 located. They have been plugged. They have
3 been reviewed by the state agency.

4 JUDGE WHITE: For the hydrocarbon
5 wells, what was the geologic formation that
6 was the target?

7 MR. DEMUTH: The primary target
8 for production is Minnelusa which is
9 approximately 7,000 to 8,000 feet in depth.

10 JUDGE WHITE: It's my
11 understanding that the geologic section
12 presented in numerous documents indicates that
13 that formation overlies the Madison aquifer.
14 Is that correct?

15 MR. DEMUTH: That is correct.

16 JUDGE WHITE: To your knowledge,
17 would there be any wells in the Ross property
18 that would be likely to have penetrated to the
19 Madison aquifer?

20 MR. DEMUTH: We have no records of
21 any wells that have penetrated the Madison
22 within the Ross perimeter area.

23 JUDGE WHITE: Good. SEI014C, page
24 239, SEI Technical Report, I'll paraphrase
25 that report and also this is paraphrasing

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1 again some of the comments counsel made in his
2 initial statement. After all the bore holes
3 have been identified and plugged, the
4 applicant will conduct aquifer tests to
5 determine among other things that the
6 overlying and underlying aquifers are
7 hydrologically isolated from the mineralized
8 sandstone. Are these aquifer tests similar to
9 the pump tests? Or will they be performed
10 similar to the pumping tests that were
11 performed earlier at well clusters for the
12 purpose of site characterization?

13 MR. SCHIFFER: Judge, this is Ben
14 Schiffer. I'll take the first pass at that.
15 In my experience and I'd think you'd hear from
16 everybody else here, those tests are typically
17 done over a fairly long duration. And that
18 duration can be 72 hours and up to a week in
19 order to demonstrate not only that there
20 hasn't been a response in the overlying or
21 underlying system but also -- and I think I
22 mentioned this yesterday -- to demonstrate a
23 response in those perimeter monitor wells. So
24 those tests vary in length and it's dependent
25 on site-specific conditions, but are generally

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1 long duration tests.

2 JUDGE WHITE: So I'd be correct in
3 saying that in a general sense those pumping
4 tests would be considered more rigorous than
5 the pumping tests carried out for the site
6 characterization.

7 MR. SCHIFFER: We had one test of
8 72 hours. And I think that that would be on
9 the pre-licensing. I think that that would be
10 likely a minimum test duration in a raw field
11 hydrologic test.

12 MR. MOORES: One other thing. In
13 my experience on those pumping tests is
14 usually you're monitoring a lot more wells
15 during the pumping test. So, yes, they would
16 be more rigorous because you do have more
17 wells that you're monitoring during the pump
18 tests.

19 JUDGE WHITE: I see.

20 JUDGE COLE: These pumping tests
21 that you just talked about, these are not
22 number specific, right? These are done in a
23 quarter of all aquifers, after pumping?

24 MR. SCHIFFER: Judge Cole, this is
25 Ben. And there's no objection typically in

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1 these tests. Actually, there's just pumping
2 of at least one well and sometimes over
3 different phases multiple wells. So there is
4 no injection of lixiviant proposed. We cannot
5 do that until we have authorization from both
6 the State of Wyoming and the NRC.

7 JUDGE COLE: I understand. How do
8 you know you get the results? What are you
9 looking for? Differences in elevation?

10 MR. SCHIFFER: Judge Cole, in my
11 experience and I think you'd hear from the
12 group at the table here, these wells are all
13 instrumented with pressure recording
14 transducers. They're logging the pressure
15 that's exerted in the wells and then that is
16 a very accurate measurement of the response to
17 pumping from usually at least one, often
18 multiple, wells. They're instrumented and I
19 believe that those instruments detect to
20 1/100th of a foot. And they log the data
21 continuously both during the buffet phase as
22 well as the recovery phase of those tests.

23 JUDGE COLE: So that would mean
24 the level of communication was pretty much --

25 MR. SCHIFFER: The instruments and

1 the data I've seen, it's very clear if there
2 is a response to a stress in the aquifers.

3 JUDGE COLE: And that would be
4 called communication, right?

5 MR. SCHIFFER: A response, it
6 depends on how it's interpreted. But given
7 the right conditions it can be interpreted as
8 a response, yes.

9 JUDGE COLE: Thank you.

10 JUDGE WHITE: So in the pre-
11 licensing site characterization -- and this is
12 really not soliciting a discussion of that --
13 am I correct that by a couple of wells there
14 was an indication of hydrologic communication?
15 A pumping test showed an indication of
16 hydrologic communication both in SEI documents
17 and in staff documents which were attributed
18 to unplugged historical bore holes. Is that
19 correct?

20 MR. SCHIFFER: Yes, that is
21 correct.

22 JUDGE WHITE: Okay. If the
23 pumping test in the wellfield indicated at
24 least for some wells a similar communication
25 with either the SM or the DM aquifer, what if

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1 any engineering or operational responses would
2 be available to SEI to remedy the situation
3 prior to commencement of mining?

4 MR. SCHIFFER: I'll take a first
5 pass at that, Judge. But there are some other
6 guys that have more experience than me. And
7 I'll be honest that first thing that you would
8 probably look at is to ensure that the
9 integrity of the wells that were tested was in
10 fact the case that the annular space between
11 the casing and a bore hole well was intact.
12 So the first engineering test that's done.
13 And our wells in this project, production
14 injection, and monitoring wells would have to
15 pass a mechanical integrity test. So that
16 would be the first engineering test.

17 And then at least in my experience
18 you would look at other potential engineering
19 solutions and/or evaluations of looking
20 primarily at the bore holes and depths of
21 penetration. So those are a couple of things
22 that we do in those scenarios.

23 JUDGE WHITE: I guess what I'm
24 getting at is these pumping tests are
25 performed to ensure that the aquifer that's

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1 the target of mining is isolated
2 appropriately. And the tests -- I'm sure you
3 hope and everybody else would too -- prove
4 that. But they don't, I'm wondering beyond
5 what you said what you could do about it.

6 MR. SCHIFFER: I'll take a first
7 pass, but I think the guys at Petro Tech could
8 provide more detail. I believe that for the
9 pumping tests there is some mathematics that
10 could be done to identify where a potential
11 leak is occurring. And that once you get it
12 down to an area you can look more closely to
13 see what potentially could be occurring there.

14 MR. DEMUTH: Judge, if I could add
15 to that. First of all, when we perform the
16 pumping test and we see a response -- just for
17 example let's say it's an improperly
18 constructed well -- in a sense there's a
19 benefit there because it shows that the
20 process works. NRC guidance and license
21 conditions require we do a wellfield pump test
22 to demonstrate confinement, to demonstrate
23 communication between the pumping well and the
24 monitor walls. So if we do have a well that's
25 an issue, the well is found. It's plugged and

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1 then the formation is retested. And we have
2 numerous examples of where exactly that has
3 happened at different sites.

4 That does give us confidence that
5 if there is a problem well it can be found.
6 It can be remediated. It can be retested.

7 In rare example where there appear
8 to be an improperly abandoned well that cannot
9 be exactly located, we have been able to
10 assist operators with engineering controls.
11 And in one situation additional monitor wells
12 in that area, overlying and underlying
13 monitoring, reduced injection pressures, those
14 types of scenarios where the operation could
15 be safely conducted.

16 JUDGE WHITE: Since the tests are
17 going to be responses, it's going to be
18 detected by a number of wells. You said
19 earlier that it might be possible to narrow
20 the area in which the leak has taken place.
21 Then would there be a mechanism by which you
22 could carry out some further exploration to
23 see if you could identify a previously
24 unlocated historic bore hole?

25 MR. DEMUTH: Yes, we refer to that

1 as triangulation where we look at the dry down
2 at distance and direction and determine the
3 most likely location of the potential problem
4 either well or unplugged bore hole.

5 JUDGE WHITE: How would you go
6 about finding an unplugged, previously
7 unlocated bore hole that had been covered by
8 wind-blown dust and so you can't see the
9 evidence of it at the surface?

10 MR. DEMUTH: Well, in that case,
11 we have to scrap the surface and look for
12 surface evidence. One thing that is very
13 encouraging from our standpoint -- and we
14 have worked on the majority of IRS projects
15 certainly in Wyoming and Colorado and Nebraska
16 -- is there is clear evidence for many of the
17 holes at rocks. And as I was talking to Mr.
18 Knode over the last couple of days it's
19 encouraging that they've been able to find so
20 many positively identified on the surface.

21 They've had a greater success at
22 that than any site that we've ever worked on.
23 So that increases our level of confidence even
24 more that they can locate those wells. Other
25 sites it's more difficult. We've used

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1 historic land set images. And sometimes it
2 comes to scraping the surface and looking for
3 surface indication.

4 JUDGE WHITE: Thank you. That's
5 all the questions I have about bore holes.
6 Judge Cole, do you have any more bore hole
7 oriented questions?

8 JUDGE COLE: No.

9 CHAIRMAN BOLLWERK: Let me just --
10 It's still eight percent, right, that they
11 have to find. They found 92 and they're still
12 looking for eight percent which is --

13 MR. KNODE: A clarification,
14 Judge. We employed summer students, summer
15 interns, to take the old survey records and to
16 take metal detectors out. They were able to
17 find the numbers that I've given to you. We
18 have not yet gone back and implemented a more
19 rigorous search for those other remaining
20 holes.

21 CHAIRMAN BOLLWERK: The eight
22 percent?

23 MR. KNODE: The eight percent,
24 right. So we do have very precise survey
25 information on that.

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1 CHAIRMAN WHITE: Okay. So there
2 will be additional efforts to locate holes.

3 MR. KNODE: Of course.

4 JUDGE WHITE: Before you perform
5 these well tests.

6 MR. KNODE: Correct.

7 JUDGE WHITE: Okay. Good. I just
8 have one really brief question to get into
9 something that I think we're probably getting
10 into more with staff and Intervenors about the
11 issue of the first arrival of lixiviant
12 indicators before uranium reaches a monitoring
13 well. And in written testimony, I believe
14 it's Mr. Demuth and Mr. Lawrence, SEI026, page
15 14, there is a statement that -- Actually, I
16 guess you're citing an NRC staff document. It
17 would probably be better addressed to staff.
18 ISL production fluids are conservative in the
19 sense that they move at roughly the same rate
20 as groundwater flow and are not significantly
21 attenuate by adsorption or reduced by other
22 factors.

23 I'm not sure whether this is
24 correct or not. Not in that specific
25 statement but I believe in another part of

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1 that testimony it's mentioned that adsorption
2 is only one factor that serves to impede or
3 reduce uranium moving through the groundwater.
4 Am I correct that by other factors you're
5 referring to this idea of natural attenuation
6 by some other process?

7 MR. LAWRENCE: The natural
8 attenuation discussion is the gross
9 compilation of all these things such as
10 adsorption or precipitation.

11 JUDGE WHITE: Okay.

12 MR. LAWRENCE: Also to some extent
13 advective flow. So dilution as you mix waters
14 one concentration with another you tend to
15 blend them out. So it's the combination of
16 all those processes.

17 JUDGE WHITE: So precipitation, by
18 precipitation, are you talking about the fact
19 that just as a result of entering a reducing
20 environment uranium converts back into
21 quadravalent ion and precipitates as uraninite
22 or something like that.

23 MR. LAWRENCE: Yes, it could
24 precipitate or co-precipitate to something
25 else just depending on the read out

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1 conditions.

2 JUDGE WHITE: Okay. So I guess
3 the point that I was trying to get to with
4 this question is that in this statement it was
5 implied that adsorption is not the only
6 mechanism by which uranium is attenuated. I
7 just wanted to confirm that that was true.
8 And you've recited a number of processes other
9 than adsorption that can do this.

10 MR. LAWRENCE: Correct.

11 JUDGE WHITE: And I guess this
12 will be explored more with the staff. So
13 that's all I have for Strata witnesses. Judge
14 Cole, anything else?

15 JUDGE COLE: Yes. So
16 substituting sulfates for chlorates I believe,
17 in this lawsuit, is a factor. Any comment on
18 that?

19 MR. SCHIFFER: Judge Cole, this is
20 Ben Schiffer. And I can talk briefly to that.
21 In what we have in the underlying water
22 interval below the ore zone that Ross is a bit
23 of a unique geochemical situation where the
24 natural concentrations of chloride were highly
25 elevated. And in that scenario using chloride

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1 as an excursion indicator we would have
2 actually had to have measure a reduction or a
3 decrease in the concentrations of chloride.
4 And that was not something that we were
5 comfortable doing and not really comfortable
6 proposing that to the regulatory agencies.

7 In lieu of chloride as an
8 excursion indicator for that particular
9 interval, we suggested sulfate. And really
10 what we're looking at here is that the sulfate
11 concentrations will increase. The sulfate
12 concentrations in that water bearing interval
13 are relatively low. So it will be easy for us
14 to detect an excursion based on an increase in
15 sulfate.

16 JUDGE COLE: So you had too much of
17 a good thing with chloride.

18 MR. SCHIFFER: Not much of
19 something that's for sure.

20 JUDGE WHITE: Is sulfate a normal
21 constituent of lixiviant or do you add the
22 sulfate strictly as an indicator?

23 MR. SCHIFFER: Sulfate in my
24 experience is going to increase in the
25 lixiviant primarily due to the dissolution of

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1 pyrite for the mining process. So it's
2 naturally going to increase during mining
3 which makes it a sortable ultra excursion
4 perimeter.

5 JUDGE WHITE: So your answer is
6 neither of my suggestions are correct. It's
7 not part of the lixiviant at all. It's added
8 to lixiviant as part of the dissolution
9 process that takes place in the mine.

10 MR. SCHIFFER: Yes, Judge.

11 CHAIRMAN BOLLWERK: Anything else,
12 Judge Cole?

13 JUDGE COLE: No, I'm fine.

14 CHAIRMAN BOLLWERK: One of you had
15 mentioned previously that I guess in other
16 places that you've worked you had dealings
17 with excursions before. I'm trying to
18 remember what the testimony was now. As you
19 were -- Let me put it this way. Is there any
20 incidents where you had concerns about a
21 particular bore hole or series of bore holes
22 or well where you were drilling that you
23 thought excursion might actually occur? Is
24 there anything that would indicate that based
25 on the monitoring that you do in the wells

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1 that you drill?

2 JUDGE WHITE: Was that part of
3 counsel's statement referring to something
4 like that?

5 CHAIRMAN BOLLWERK: It may have
6 been. I don't remember.

7 MR. DEMUTH: Your Honor, if I
8 might take a stab at that. Yes, we have
9 performed wellfield pump tests where we've
10 located wells that had they remained in that
11 condition could have caused an excursion.

12 CHAIRMAN BOLLWERK: Okay.

13 MR. DEMUTH: Those wells were
14 located. They were plugged. And then the
15 formation was retested to show that that
16 pathway no longer existed. So does that help
17 answer your question?

18 CHAIRMAN BOLLWERK: Right. And so
19 if you see that, does that mean that you're
20 going to run other pump tests? Or if you see
21 that here, does that suggest that's there a
22 problem in this particular area? Once you
23 have that happen, what is your response then
24 in terms of others or being concerned about
25 other potential excursions like that?

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1 MR. DEMUTH: Commonly, those are
2 discovered during the wellfield scale pump
3 test. And we'll see that there might be an
4 issue in one well and in one location.

5 That does not necessarily reflect
6 on the other parts of the pump test. If we
7 did have communication, we'd see the dry down
8 response that would so indicate. But just
9 because we have one well that might be a
10 problem doesn't mean that all the wells are a
11 problem.

12 If it were a geologic issue, it
13 might cause you to go back and revisit some of
14 the geology and make sure you're understanding
15 the geology is as complete as it needs to be.
16 And we've done that as well.

17 CHAIRMAN BOLLWERK: And again I
18 take that based on what you've seen with the
19 well test here, there's not a concern in that
20 regard.

21 MR. DEMUTH: Based on review of
22 the Strata data, I have no concerns about the
23 confinement that's been demonstrated by the
24 hydraulic testing to date.

25 CHAIRMAN BOLLWERK: All right.

1 Thank you. I'm sorry. My question was not
2 very artfully worded. I appreciate you.

3 MR. LAWRENCE: Can I add just a
4 little bit to that?

5 CHAIRMAN BOLLWERK: Sure.

6 MR. LAWRENCE: A couple of things
7 to consider. It's not like once the wellfield
8 test is done that there's no additional
9 indications of excursions. Obviously, the
10 whole ISL concept is based on a lot pumping
11 and injecting.

12 CHAIRMAN BOLLWERK: Right.

13 MR. LAWRENCE: So the whole point
14 of having the overlying and underlying monitor
15 wells is to detect any changes. Typically,
16 the first thing you're going to see is
17 changing water levels in those wells if there
18 is some kind of leakage going on. So you
19 would have throughout the course of your
20 operations continuous monitoring that would
21 indicate if you are developing a problem in
22 one particular area.

23 You might not see it initially
24 because you're not operating in that part of
25 the wellfield. But as you move closer to it,

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1 all of a sudden you see some indication in
2 terms of typically a change in pressure in the
3 well that would tell you that there seems to
4 be something going on here that we need to
5 look at more closely and remediate or fix
6 before we continue on.

7 And that brings up one other
8 point. We've been talking about these
9 excursion perimeters. But the best perimeter
10 is the water level indication because those
11 pressures are the first things that show up as
12 an indication that you have something out of
13 bounds or something that is communicating it
14 shouldn't be. And that happens long in
15 advance of any alkalinity arrival. So there
16 are other safeguards in place even beyond what
17 we've been talking about.

18 CHAIRMAN BOLLWERK: All right.
19 Thank you.

20 JUDGE WHITE: Yes. That's
21 interesting. I hadn't seen that in the
22 documents. So the lixiviant indicators, the
23 sulfates are monitored every two weeks. How
24 is the water level monitored? Is that also
25 measured on an every two weeks basis? Or is

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1 there some way that an abrupt change in the
2 water level in those wells would be indicated
3 between regular intervals of geochemical
4 monitoring?

5 MR. SCHIFFER: Judge, this is Ben
6 Schiffer. And a normal course of protocol and
7 procedure prior to any sample collection of a
8 monitoring well a water level is taken. And
9 in my experience, those water levels are then
10 compared to water levels from the preceding
11 two week interval and looked at in terms of
12 any long term trends. It's absolutely a
13 matter of procedure that a water level be
14 taken.

15 And just for clarification the
16 sulfate is only for the underlying interval at
17 the Ross project. Chloride, alkalinity, EC
18 are the excursion parameters for the perimeter
19 monitoring well ring as well as the overlying
20 monitor well system.

21 CHAIRMAN BOLLWERK: Thank you for
22 that. Judge Cole, anything you might have
23 additional?

24 All right. Then I think for this
25 panel then I think we're ready for any cross

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1 examination questions there might be, opposed
2 cross examination questions. Do you all need
3 five or ten minutes? Fifteen minutes? What
4 do you think?

5 MR. PUGSLEY: Five is fine.

6 CHAIRMAN BOLLWERK: Five. All
7 right. We'll take a five minute break then.
8 Off the record.

9 (Whereupon, the above-entitled
10 matter went off the record at 3:02 p.m. and
11 resumed at 3:11 p.m.)

12 CHAIRMAN BOLLWERK: Can we go back
13 on the record please. We've been informed by
14 the parties that there are no additional cross
15 examination questions they wish to propose.
16 So at this point, gentlemen, subject to being
17 recalled for our grand session at the end,
18 thank you for the information you've provided
19 and your service to the Board.

20 We are not going to proceed with
21 the staff's witnesses on Contention 3.

22 MR. HARPER: Your Honor, it
23 appears that Mr. Burgess has stepped outside
24 for a moment. If we could --

25 CHAIRMAN BOLLWERK: Sure. Why

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1 don't we just take a two minute recess until
2 he comes back. Off the record.

3 (Whereupon, the above-entitled
4 matter went off the record at 3:12 p.m. and
5 resumed at 3:13 p.m.)

6 CHAIRMAN BOLLWERK: Let's go back
7 on the record please. If the staff panel
8 could identify themselves for the record
9 please.

10 MS. MOORE: Johari Moore.

11 DR. JOHNSON: Kathryn Johnson.

12 MR. BURGESS: Anthony Burgess.

13 MR. SAXTON: John Saxton.

14 CHAIRMAN BOLLWERK: All right.
15 And all of you have been placed under oath
16 previously. Mr. Burgess, we brought your
17 testimony in a little earlier because it was
18 a unified testimony and then swore you in and
19 then had you step aside. Now you're back and
20 again everyone remains under oath.

21 I believe there's some testimony -
22 - All the testimony is in now I believe.

23 MR. HARPER: That's correct.

24 CHAIRMAN BOLLWERK: So we need to
25 start with the NRC exhibits. And I think it's

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1 39 the first one.

2 MR. HARPER: I believe so, Your
3 Honor.

4 CHAIRMAN BOLLWERK: All right.
5 Let's then start with exhibits and we're going
6 to identify for the record which is a Wyoming
7 Department of Environmental Quality 2001
8 document letter of conference and conciliation
9 exclusion at Cameco Resources Well CM-32;
10 NRC's 040, Uranium I Mine Unit 5 response
11 August 2010; NRC 041, Uranium I 2012
12 document, the Willow Creek Project monthly
13 excursion report for selected monitor wells;
14 NRC 042, an NRC document dated 2007,
15 NUREG/CR6870, consideration of geochemical
16 issues in groundwater restoration at Uranium
17 in situ leach mining facilities.

18 Moving on from there, we have
19 NRC050 which is an NRC document from 1985,
20 NUREG/CR-3709, Methods of minimizing
21 groundwater contamination from in situ leach
22 uranium mining; and NRC 051, which is a
23 Wyoming Department of Environmental Quality
24 1978 letter on Christianson Ranch restoration.

25 (Whereupon, the above-

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1 referred to documents
2 were marked as Exhibits
3 NRC039-NRC042 and
4 NRC050-NRC051 for
5 identification.)

6 Is that everything?

7 MR. HARPER: That is everything.

8 CHAIRMAN BOLLWERK: All right.

9 Those documents having been identified for the
10 record, let's move them into evidence. There
11 being no objections, then NRC039-NRC042 and
12 NRC050-NRC051 are all admitted into evidence.

13 (Whereupon, the above-
14 referred to documents
15 marked for
16 identification as
17 Exhibits NRC039-NRC042
18 and NRC050-NRC051 were
19 received into evidence.)

20 With that, we turn to Judge White.

21 Do you have some questions?

22 JUDGE WHITE: I do. We just heard
23 Strata' witnesses testify about their efforts
24 to identify, locate and plug historical bore
25 holes within the production monitoring region

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1 of the Ross site. But I have a few questions
2 just to clarify in my mind what the
3 consequences would be if there were unlocated
4 and improperly or unplugged bore holes within
5 the facility area.

6 I'm not sure that that's been
7 adequately explained in my mind anyway in the
8 documents I've read. So I would like to
9 explore that very briefly.

10 To begin with to quote the FSEIS,
11 page 311, "ISL operations withdraw an average
12 of 1.25 percent more water than is injected
13 into the wellfields which is referred to as
14 production bleed. Groundwater bleed ensures a
15 net inflow of groundwater into the wellfield
16 to minimize potential movements of lixiviant
17 and its associated contaminants out of the
18 wellfield."

19 Would you say that maintaining
20 production bleed is a primary defense against
21 lateral excursions of lixiviant during mining?

22 MR. BURGESS: Yes, that is primary
23 method. Yes.

24 JUDGE WHITE: So I'm curious about
25 how the presence of unplugged bore holes would

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1 react in a mining situation. How would it
2 affect groundwater flow? In other words,
3 would the artificial gradient created by
4 production bleed cause groundwater to flow
5 into the production zone from aquifers above
6 and below the ore horizon along conduits
7 generated by unplugged bore holes?

8 MR. BURGESS: That would dependent
9 on the relative hydraulic heads in the
10 overlying and underlying aquifers relative to
11 what the head is in the ore zone. Currently,
12 in the SM aquifer, the piezometric head, the
13 hydraulic head, is of the order of 100 feet
14 higher than in the ore zone. So if there were
15 an unplugged bore hole, it would induce a
16 higher head in the ore zone than would
17 normally be the case.

18 JUDGE WHITE: And this is in
19 consequence or in conjunction with the fact
20 that there is an artificial reversal of normal
21 flow into the ore zone created by the
22 production bleed.

23 MR. BURGESS: Yes. I mean that
24 artificial reversal is only in the ore zone.
25 And that is taking the ore zone or the

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1 individual wellfield as a whole. Within that
2 individual wellfield, there will be areas
3 obviously of injection and areas of
4 extraction.

5 So whether the head is higher or
6 lower than in the overlying or underlying
7 aquifer would depend upon where that unplugged
8 bore hole is relative to the injection points
9 and the extraction points and depend upon the
10 relative heads in the overlying and underlying
11 aquifer relative to the ore zone.

12 CHAIRMAN BOLLWERK: I think if you
13 would press your microphone down a little bit
14 closer to your mouth.

15 MR. BURGESS: How's that? Better?

16 CHAIRMAN BOLLWERK: There we go.
17 Yes. Thank you.

18 JUDGE WHITE: In the possibility
19 of appearing dense which I am with regards to
20 groundwater hydrology, my simpleminded view,
21 the production bleed for the wellfield as a
22 whole is insurance against excursions because
23 lateral flow of water within the ore zone
24 aquifer is in general sense always going to be
25 moving slightly toward the wellfield as a

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1 whole.

2 MR. BURGESS: That is correct.

3 JUDGE WHITE: That is correct. If
4 there's an easy connection between aquifers
5 above and below, wouldn't the production bleed
6 tend to then also draw water from those
7 aquifers into the ore zone aquifer owing to
8 this negative gradient that's generated there?
9 You probably answered that. But if you could
10 answer it again in an even simpler way, I
11 would appreciate it.

12 MR. BURGESS: First of all, the
13 concept of the ore zone is correct that the
14 heads towards the outside of the ore zone or
15 the wellfield are higher or above than the
16 heads within the wellfield. So there's this
17 net inward flow. And that flow is due to the
18 hydraulic heads from the outside relative to
19 what they are where there's pumping going on.

20 Now you've also got to consider
21 what is the hydraulic head in the overlying or
22 underlying aquifer relative to what it is in
23 the ore zone. As I pointed out in the SM
24 aquifer, the head is about 100 foot, maybe 130
25 feet, higher. It varies. But it's certainly

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1 times feet higher than it is in the ore zone.

2 Even under conditions as they
3 exist currently, if there is an unplugged bore
4 hole which is a significant conduit it would
5 as of today be feeding water into the OZ
6 aquifer. And that would manifest itself by
7 seeing as it were the opposite of a cone of
8 depression, a cone of increase in head in the
9 OZ aquifer.

10 To the best of my knowledge, we
11 haven't seen that. And to some extent that's
12 come forward by the fact that there are
13 pumping wells in the industrial pumping wells.

14 Judge Cole.

15 JUDGE COLE: When you've got
16 another aquifer driving more into the OZ zone
17 it will increase the flow in that aquifer
18 wouldn't it, that traveling in the reverse
19 direction?

20 MR. BURGESS: Yes. Likely an
21 artificial charge into that aquifer. So it
22 would increase the head at the location of
23 that bore hole and the effect of that would
24 spread out radially from that unplugged bore
25 hole.

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1 JUDGE COLE: Okay. Now without
2 the bore hole being there and creating a
3 problem, the hydraulic feed line in the ore
4 zone creating the flow towards the center
5 receiver is caused by pumping systems,
6 correct, that control flow? Is that correct?

7 MR. BURGESS: You're saying
8 during operation or currently?

9 JUDGE COLE: During operation.

10 MR. BURGESS: During operations,
11 the pumping systems within the wellfield that
12 are pumping slightly more water when it's
13 being injected in the injection wells.

14 JUDGE COLE: So the adding of
15 additional water might not change that system
16 very much except by rerouting it.

17 MR. BURGESS: That is correct.
18 That's what I'm saying. It depends on the
19 route you have. Suddenly, the SM aquifer has
20 a head above the ore zone aquifer. So as long
21 as that is maintained by head gradient, as I
22 say, the only problem is you're going to
23 direct the lixiviant to the OZ.

24 JUDGE COLE: Thank you.

25 JUDGE WHITE: So in that situation

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1 then if you had an unplugged conduit, you're
2 saying water would flow from the SM aquifer
3 into the OZ aquifer.

4 MR. BURGESS: Provided the head in
5 the SM was higher than the head in the OZ at
6 that location, yes.

7 JUDGE WHITE: And then would water
8 flow into or out of the DM aquifer?

9 MR. BURGESS: In general the heads
10 in the DM are similar to the OZ or slightly
11 less than the OZ. So if that penetration were
12 further from OZ and into the DM then there's
13 the potential for it to flow out of the OZ and
14 into the DM.

15 JUDGE WHITE: But most of the
16 Nubeth holes would have ended in the OZ
17 aquifer and it would have penetrated the SM
18 but not the DM.

19 MR. BURGESS: That's my
20 understanding because they were going after
21 the ore and the ore was obviously limited to
22 the OZ and didn't extend into the DM.

23 JUDGE WHITE: I guess all of this
24 roundabout is to try and answer the question
25 I had in my head which was that if there were

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1 an unplugged bore hole and if additional water
2 were flowing into the OZ down from the SM
3 would that tend then to sort of counteract the
4 production bleed in preventing lateral outward
5 flow.

6 MR. BURGESS: I think I understand
7 what you're saying. That would depend upon
8 the relative amount of flow in that unplugged
9 culvert relative to the production bleed.

10 JUDGE WHITE: Right.

11 MR. BURGESS: But I think what
12 happened is that the amount of the wells in
13 the OZ during operation you would see
14 anomalous heads. And the operators would
15 therefore correct for those so that they would
16 maintain the overall inward bleed.

17 JUDGE WHITE: I know it's a lot
18 more complicated. But I'm just trying to
19 think about what the consequences of these in
20 a little more rigorous way, the consequences
21 of unplugged bore holes, might be during
22 production. And so it might be fair to say
23 that if for inexplicable reasons the
24 production was maintained at a constant bleed,
25 then the fact that there was an unplugged bore

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1 hole could, in fact, make production less
2 effective in controlling lateral migrations
3 and also make production be less effective in
4 controlling lateral excursions.

5 But you're saying that if such a
6 connection was available and did occur, that
7 it would be recognized by the operators and
8 adjusted for relatively quickly.

9 MR. BURGESS: Yes. That's how I
10 understand it. The production bleed doesn't
11 set upon a number that this is what the
12 production bleed is going to be. It's
13 basically that we will adjust water levels
14 such that there's orbital flow and we believe
15 that there will be results in the production
16 bleed of about one and one-half percent,
17 something like that.

18 JUDGE WHITE: And then finally in
19 the scenario that I believe I understand you
20 outlined, the consequences of introducing
21 contaminant-bearing lixiviant into the SM
22 aquifer or not the consequences but the
23 likelihood of contaminant-bearing lixiviant
24 moving up into the SM aquifer is highly
25 unlikely. But it might be more likely that

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1 contaminant-bearing lixiviant would move
2 downward into the DM aquifer. And in fact
3 that's what I guess -- maybe not lixiviant --
4 the connection was when they believed that
5 there was some connection during the pre-
6 licensing pumping tests. They seemed to show
7 connectivity there.

8 MR. BURGESS: Yes. There were I
9 believe a couple of tests that did show or did
10 indicate that there might be some connection
11 from the OZ into the DM.

12 JUDGE WHITE: But am I correct in
13 a kind of simpleminded way of saying that the
14 aquifer below the ore zone aquifer would be
15 more at risk for contamination than the
16 aquifer above if there were an unplugged bore
17 hole existing during production?

18 MR. BURGESS: Yes. With the
19 caveat that there are a lot less unplugged
20 bore holes from the OZ to the DM.

21 JUDGE WHITE: That's right.

22 MR. BURGESS: Than the OZ to the
23 SM.

24 JUDGE WHITE: We did previously
25 mention that, didn't we?

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1 MR. BURGESS: Yes.

2 JUDGE WHITE: Thank you.

3 MR. SAXTON: Your Honor, I just
4 want to add one clarification, though. In the
5 production area, you're going to have
6 injection well and production wells. Near the
7 injection well, you will have a greater head
8 than the average dry down. And there could be
9 a potential right there. That is why we
10 require especially within the wellfield to tag
11 all the bore holes.

12 Again, 100 feet of head is what
13 you need. And at the injection rates that
14 they have it's probably not going to be
15 exceeded. But it is a potential that because
16 that's where at the local area of the
17 injection well it's higher than the average.

18 JUDGE WHITE: So then there would
19 be a potential for upward movement of
20 lixiviant.

21 MR. SAXTON: It's a potential.
22 But I'm saying probably not at 100 feet. I
23 doubt that it's 100 feet, but it could
24 especially if the well gets plugged or
25 something you can't inject as much as you

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1 want. But that is why we require the plug in
2 the wells and the monitoring to make sure.

3 In addition to the bore holes,
4 it's the well casings that also could
5 contribute to flow. If the well casings
6 aren't complete, that would be a conduit as
7 well. So that and the MIT tests on the wells,
8 it's all integrated to make sure that there's
9 control within the production area.

10 JUDGE WHITE: And the well casings
11 issue you just described is similar to the
12 likely issue that Strata witnesses described.
13 If pre-production pumping tests showed that
14 there was leakage, that would be their first
15 likely culprit. Is that correct? And that's
16 what you're describing, too.

17 MR. SAXTON: Yes. In the case
18 that they were describing actually when they
19 were leaning the well out, the reamer actually
20 stayed open and it cut a hole in the casing.
21 And that's why a poor cement job in that case.
22 But yes. That's indeed the case.

23 But if you had it close in that
24 job and then over time it didn't maintain the
25 integrity of the well, it could be an avenue.

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1 So again it's just one of the things that we
2 have to look at and we try to make sure that
3 there's adequate monitoring. All the
4 monitoring is designed to minimize that
5 impact.

6 JUDGE WHITE: One last question
7 about these, if pumping tests do show the OZ
8 aquifer is not sufficiently isolated, what
9 action from the NRC staff's standpoint with
10 regards to regulatory action would staff
11 take. In other words, are you monitoring the
12 results of these pre-production pumping tests
13 and ensuring that eventually the problem is
14 solved if a problem does arise?

15 MR. SAXTON: Generally, if they
16 recognize a problem they will identify it
17 before they submit well completion or
18 wellfield data report to us. If it is
19 geologic -- let's say they finally air things
20 out dramatically -- we would expect that they
21 put a well there at least or enhanced
22 monitoring or not include production zones in
23 that area.

24 We're going to require them to
25 maintain possession of the lixiviant in the

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1 exempted aquifer. If it gets out, then they
2 have to correct for it no matter what the
3 source is. We will be looking at that, yes.

4 JUDGE WHITE: Okay. And that was,
5 in fact, a question that I was going to have
6 that you just answered before I asked. That
7 was what if there was a situation such as
8 something inherent within the geology that
9 made a certain portion of the wellfield just
10 impossible to mine without excursions. Then
11 NRC staff would ensure that, in fact, that
12 portion of the wellfield wasn't mined.

13 MR. SAXTON: That is correct. And
14 it would be counter to what their conceptual
15 model was that they presented in the
16 application. And we would make sure that they
17 revised their conceptual model and make sure
18 if indeed there is connection then they have
19 to demonstrate to us that they know throughout
20 the entire wellfield what is going on.

21 JUDGE WHITE: Any further
22 questions about bore holes, Judge Cole?

23 JUDGE COLE: No.

24 CHAIRMAN BOLLWERK: I'm good at
25 this point.

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1 JUDGE WHITE: I was going to ask
2 one or two questions about this issue again of
3 excursion monitoring. And this probably is
4 going to be answered by Dr. Johnson. In his
5 rebuttal testimony, JTI052R, page 19, Joint
6 Intervenors' witness, Dr. Larson, described a
7 number of studies both published and I think
8 studies that he actually performed himself or
9 data analysis that he performed himself,
10 indicating that uranium is not a strongly
11 adsorbed on the surfaces of minerals if it is
12 complexed with calcium and carbonate. And he
13 went on to assert that because of this
14 indicator compounds would not reach monitor
15 wells before uranium, but would presumably
16 arrive at the same time. And therefore it
17 would increase the likelihood that water
18 outside the monitoring ring would become
19 contaminated.

20 Now Dr. Johnson addressed this in
21 her rebuttal testimony, NRC044R, page 25. I
22 want to ask again for a little clarification
23 from Dr. Johnson. Once uranium combines with
24 calcium and carbonate to form a soluble
25 complex, you state that the change in water

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1 chemistry could reverse this process and
2 liberate U-6 ions back into the groundwater.
3 And would you expect this to occur when
4 uranium-bearing lixiviant flows away from the
5 ore-rich zone?

6 DR. JOHNSON: Yes, Judge White.
7 In fact, many of these studies that are
8 referenced are studies to understand the
9 effect of the controlling parameters, which in
10 the most part is the carbonate concentration
11 of alkalinity, the calcium concentration and
12 also uranium concentration. Those are the
13 parameters that affect the degree of complex
14 solution and then how those complexes behave.
15 Are they stable? Do they fall apart or just
16 whatnot? So many of these studies really
17 that's what they address. They address the
18 effect of those parameters.

19 But to fully answer this question,
20 if we could have Exhibit JTI058 on the screen
21 please. And this is actually just right in
22 the abstract. Here we go. I can read it
23 here.

24 This is really -- I'm having a
25 little trouble. So about halfway down in that

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1 abstract it says, under conditions where, and
2 it's the calcium-uranium-carbonate species,
3 and we're seeing the different parameters, but
4 the level of calcium that's what they were
5 adjusting up and down. It reduced the
6 adsorption of quartz from 77 percent in the
7 absence of -- could you slide it over please
8 -- of calcium to 42 percent and then the
9 adsorption on the ferrihydroxide which is iron
10 hydroxide from 83 percent to 57 percent in
11 different concentrations of calcium.

12 There's no question that the
13 complexes form. And the degree of how much
14 they remain in solution versus things that are
15 absorbed on these different media are variable
16 and they vary depending upon the particular
17 chemicals. Here of course it's calcium that
18 they were measuring.

19 But it's a range. But some of that
20 range goes to zero percent adsorption. So
21 there's always some adsorption of these
22 complexes. Because we don't know what the
23 level of adsorption is going to be in the
24 aquifer because these parameters can change
25 and they can change in particular when they

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1 move from the production area where the
2 lixiviant has been there versus outside, the
3 chemistry can change dramatically. And it's
4 very sensitive to these parameters.

5 At a minimum, the adsorption is
6 going to be at a lower number and at a maximum
7 it could be a higher number. So we just don't
8 know. And therefore we just don't make
9 predictable parameters for early detection.

10 JUDGE WHITE: Could you explain a
11 little bit and I guess I'm not fully clear
12 about this adsorption process. So it was
13 mentioned earlier that somewhere along the
14 line that what we're looking at are specific
15 sites on the surface of a crystal that are
16 receptive to adsorption of an attachment of a
17 uranium ore, in this case, less susceptible
18 but it's still somewhat susceptible to
19 attachment of one of these complexes.

20 Now I think we also heard something
21 about that there's sort of a limited number of
22 these sites. And once you move enough uranium
23 you can fill up all the sites. And then
24 adsorption no longer becomes effective. Is
25 that correct?

1 DR. JOHNSON: In a very narrow
2 slice of the aquifer I would say that's
3 correct. But the surface of iron hydroxide is
4 a very dynamic surface. Iron hydroxide, if it
5 matures and it's hydrated. So those autumns
6 of water which are really kind of an OH,
7 they're constantly changing in these
8 situations.

9 Even though when we do modeling,
10 when I do modeling of adsorption, we put a
11 number in for how many sites are available.
12 That's kind of a theoretical situation because
13 it's a very dynamic situation out in the
14 field. But also let's say that they do get
15 saturated at one location when the water flows
16 into the next cell and the next box, then they
17 will be adsorbed there and then it's the next
18 one.

19 I mean it's a fact that they do get
20 saturated. So you have to move downstream to
21 take on the next line. And that's how it
22 works. So it really depends upon the capacity
23 of the iron hydroxide or in this case they
24 were doing some experiments with quartz also.
25 It's the capacity to adsorb. It's how much

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1 uranium that will be adsorbed. And then
2 really you calculate how long it will take.

3 JUDGE WHITE: The theory behind the
4 lag -- see if I'm correct on this -- is that
5 the leading uranium and the lixiviant
6 indicators start out together in a moving mass
7 of groundwater. The leading uranium as soon
8 as they get into one of these adsorption
9 environments drop out because they're attached
10 to the surfaces of these minerals.

11 Meanwhile, the lixiviant indicators
12 are unaffected by any of this and continue to
13 moving on. Eventually, as the surfaces get
14 saturated, uranium will eventually reach the
15 monitor well. But it will reach it after the
16 lixiviant indicators because the leading
17 uranium ions have all been grabbed onto by the
18 mineral surfaces along the way. Is that too
19 simplified or is that kind of the idea?

20 DR. JOHNSON: No, that's the idea.
21 And I think there's just one other
22 consideration that needs to be thought about
23 and that is that to detect these in these
24 monitoring wells there's always a background
25 or a naturally occurring level of all these

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1 constituents. To be a indicator, not only
2 does it have to move in the groundwater but it
3 has to be a large enough difference between
4 what is already existing. So when it gets
5 there you recognize it. You don't get it
6 mixed up with what might already be there
7 naturally.

8 So a molecule let's say of uranium
9 could make it there at the same time chloride
10 would make it there. But the concentration
11 would be low and you may not see it over the
12 naturally occurring level. Whereas, chloride
13 let's just say none of it would be retarded
14 along the path. When it arrives at that
15 monitoring well, the concentration would be
16 there in great enough magnitude that it could
17 be easily seen right there at the naturally
18 occurring level.

19 JUDGE WHITE: And then finally the
20 document, the journal article, you just showed
21 us indicates that still some, even if these
22 uraniums are complex, of them will be
23 adsorbed, less than if it were uranium ions
24 isolated and not complex. But some would.

25 Were the numbers that are cited in

1 that article be significantly retard the
2 movement of uranium even if the uranium
3 remained in complex? Or are those numbers
4 indicating that that would be effectively as
5 if they weren't adsorbed? What kind of effect
6 does the complexing have? Does it completely
7 eliminated this lag? Or does it simply make
8 the lag less effective?

9 DR. JOHNSON: Well, certainly the
10 complexes increase the solubility of uranium.
11 In other words, no adsorption. But to me the
12 important part of these research studies to
13 show that -- I think the numbers could range
14 anywhere from like 10 percent adsorption to 88
15 percent adsorption.

16 JUDGE WHITE: Right.

17 DR. JOHNSON: And that they are so
18 sensitive to certain parameters that it's just
19 not possible to predict.

20 JUDGE WHITE: Those were controlled
21 experiments.

22 DR. JOHNSON: Yes.

23 JUDGE WHITE: So all variables
24 weren't tested in those experiments.

25 DR. JOHNSON: And that's another

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1 parameter, yes. They were controlled
2 experiments. So it's even more difficult to
3 really take these experiments and really
4 understand to a high level of certainty what's
5 going to happen out in the field. But the
6 general kind of school of thought is that
7 carbonate complexes -- now they're
8 understanding more about these calcium
9 carbonate complexes -- certainly increases
10 solubility.

11 And that's why it's used in the
12 lixiviant to dissolve it and solublize it.
13 But the adsorption is a factor and even though
14 calcium carbonate complex, it's not considered
15 conservative because of these varying degrees
16 of adsorption as in the case of chloride for
17 example.

18 JUDGE WHITE: And my last question
19 is given the complexity of the geochemical
20 environments in these systems, are there
21 conceivable natural processes that would
22 impede or restrict or take out of solution the
23 sulfates or other lixiviant indicators? I
24 mean, can we count on them remaining in
25 solution in these environments?

1 DR. JOHNSON: The chloride is
2 considered to be the closest thing to a more
3 conservative indicator.

4 JUDGE WHITE: But they can't use
5 that at Ross.

6 DR. JOHNSON: Well they can for the
7 horizontal to detect horizontal excursions.
8 It's just that vertical excursions dive into
9 the underlying interval of groundwater that
10 has the high chloride background. But
11 chloride is used for the horizontal.

12 JUDGE WHITE: Oh, I see. I was
13 thinking that was --

14 DR. JOHNSON: And the upper.

15 JUDGE WHITE: -- sulfate used for
16 that as well.

17 DR. JOHNSON: No, just in the
18 lower, the first interval below the ore zone.
19 So chloride certainly works. Now alkalinity
20 and sulfate, we could create a scenario where
21 they wouldn't be as conservative as chloride
22 because of certain reactions. But even if
23 there were some reactions that affected it
24 slightly, because of the difference in
25 concentrations between what is naturally

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1 occurring at that perimeter well ring and the
2 lixiviant, they make good early detector
3 parameters.

4 And electric conductivity, that's
5 a mixture. So because of the differences in
6 the concentrations between these detection
7 wells in the monitoring ring and the
8 lixiviant, electric conductivity is a very
9 good indicator.

10 JUDGE WHITE: Thank you.

11 Judge Cole, anything on this issue
12 or any other issue related to Contention 3?

13 JUDGE COLE: No.

14 JUDGE WHITE: Nothing at this
15 point.

16 CHAIRMAN BOLLWERK: I don't have
17 anything at this point. So I guess we're at
18 the point where we're looking for any opposed
19 cross examination questions for this panel.
20 And do you need five, ten, fifteen?

21 MR. PUGSLEY: Five minutes is fine.

22 CHAIRMAN BOLLWERK: Five minutes.
23 Does anybody want to take a break at this
24 point to use the restroom? Do you want to
25 take additional time?

1 MR. PUGSLEY: Five minute break.

2 CHAIRMAN BOLLWERK: Is five minutes
3 good enough? All right. We'll do that then.
4 We'll take a five minute break and see if
5 there is any cross examination. Off the
6 record.

7 (Whereupon, the above-entitled
8 matter went off the record at 3:51 p.m. and
9 resumed at 4:09 p.m.)

10 CHAIRMAN BOLLWERK: Can we go back
11 on the record please. All right. We're back
12 from consulting with Judge Cole. We had one
13 question and it reads this way. What is the
14 protocol for plugging and abandoning bore
15 holes once found?

16 MR. BURGESS: My understanding is
17 that they follow the guidelines of the Wyoming
18 regulatory agency. I forget which in
19 particular. But that's the guidelines that
20 they follow.

21 CHAIRMAN BOLLWERK: So do you know
22 exactly what the protocol is? What the steps
23 are or?

24 MR. BURGESS: No, I don't know.
25 Not off the top of my head.

1 CHAIRMAN BOLLWERK: Does someone
2 else want to comment?

3 MR. SAXTON: Strata has it in the
4 application in one of the appendices. Strata,
5 do you have the appendix that has the plug
6 ins? 2.6?

7 CHAIRMAN BOLLWERK: Is someone has
8 it we'll wait? If someone has a record site,
9 that would be terrific?

10 MS. ANDERSON: Your Honor, we would
11 appreciate having that for this witness.

12 MR. SAXTON: Can you pull up
13 SEI014A? Can you go to the table of contents?

14 MR. PUGSLEY: It's SEI014F at 29.
15 Twenty-eight.

16 CHAIRMAN BOLLWERK: Take a look at
17 that and then I'm going to have a second
18 question for you.

19 PARTICIPANT: Third paragraph.

20 MR. SAXTON: Thank you. Okay.

21 CHAIRMAN BOLLWERK: Could you
22 shrink that just a little bit more? To 100
23 percent. There we go. Terrific.

24 MR. HARPER: Your Honor, in order
25 to get this in the record would it be

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1 acceptable to request the witness to read that
2 section?

3 CHAIRMAN BOLLWERK: If that would
4 be useful. I think the second question I'm
5 going to ask but we'll --

6 MR. SAXTON: Hole plugging
7 procedures include locating the hole, enter
8 the drill hole with a bit and drill pipe which
9 is washed to the bottom. The type 1 submit
10 14.8 to 15 pounds per gallon with two percent
11 bentonite is put through the drill pipe and
12 then the pipe is removed from the hole. The
13 hole is topped off with cement and a narrow
14 metal ID tag is placed at the surface. As
15 discussed in Addendum 2.7(f), Aquifer test
16 report, some 55 holes in the vicinity of the
17 1218 well cluster were located, reentered and
18 plugged in this fashion. It is Strata's
19 intent to locate the remainder of the Nubeth
20 drill holes and banter them in a similar
21 fashion.

22 CHAIRMAN BOLLWERK: All right. So
23 you indicated that it's your understanding
24 that this is Wyoming protocol, Wyoming State
25 protocol, that they're following.

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1 MR. BURGESS: Yes. I'm not sure if
2 that was correct, but this indicates the
3 method by which they do it.

4 CHAIRMAN BOLLWERK: That indicates
5 I'm sorry.

6 MR. BURGESS: This indicates the
7 method by which they do plug the holes.

8 CHAIRMAN BOLLWERK: Okay. So the
9 question that I have for you is given what we
10 just saw and what we just heard and what you
11 told me, how documented and verified by the
12 NRC staff is this process. In other words,
13 what have you all done in terms of adopting it
14 and indicating that this is what the Ross or
15 other applicants should be following?

16 MR. SAXTON: When they cement the
17 wellfield data package, I expect that there
18 would be filed a list of all the wells that
19 they abandoned. The exact procedure is the
20 licensee is under two programs, one of which
21 is the state's UIC program and the procedures
22 to abandon the holes are generated from that
23 program. And we accept that as the proper way
24 of abandoning the wells.

25 CHAIRMAN BOLLWERK: So then you

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1 anticipate that any wells that are abandoned
2 are going to be done in line with whatever the
3 state protocol and the state process.

4 MR. SAXTON: That is correct.

5 CHAIRMAN BOLLWERK: All right. Any
6 questions you have about that?

7 JUDGE WHITE: No, I have no
8 questions.

9 CHAIRMAN BOLLWERK: Judge Cole?

10 JUDGE COLE: No.

11 CHAIRMAN BOLLWERK: All right. And
12 again let me just ask one other question
13 actually. So what degree as they do this
14 process do you all inspect for that process?

15 MR. SAXTON: Do we physically go
16 out and verify that they properly abandoned
17 the holes? We're on the site for probably a
18 semi-annual inspection. At that time, we
19 usually either go see sampling of the wells or
20 if they happen to be doing a pump test, I went
21 and observed the pumping test.

22 If they are plugging holes, I will
23 go over and look at it what they're doing.
24 But normally the Applicant committed to doing
25 this. We verify the records that show that

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1 they properly abandon up the bore holes.
2 That's NRC's policy of what we do.

3 CHAIRMAN BOLLWERK: Right.

4 MR. SAXTON: We don't have to go
5 and be there 100 percent of the time.

6 JUDGE WHITE: But they are required
7 to have a record other than -- I mean, does
8 the record extend to anything other than
9 here's the bore hole, check we abandoned it?
10 Or is there some record of in this particular
11 bore hole we put down so many cubic feet of
12 cement or so many cubic feet of bentonite?

13 MR. SAXTON: Generally, that's --

14 JUDGE WHITE: Do you have numbers
15 attached to any of that?

16 MR. SAXTON: I think both ways.
17 Mostly to keep record of what they put down.
18 Sometimes they put bentonite mixture or
19 sometimes cement. And then they have to case
20 it off with cement at the top at the surface.
21 So that's another piece of the record.

22 It's usually a line item that we
23 would look at and we'll have various columns
24 of what they did. Yes, it's a combination of
25 here is the bore hole and here's the date.

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1 Here's probably the rig that did it and the
2 person who did it. As an NRC inspector, we
3 would go out and ask them about it.

4 For instance, if there is a problem
5 with the bore hole -- let's say there is a
6 detection in the overlying, then they say it's
7 the bore hole. We would ask to see that
8 record. We would ask to talk to the person
9 who did the abandonment.

10 But generally the records are not
11 just check-off. But there is some other
12 additional information. We don't have a
13 format for each licensee to record. But we do
14 make sure that they maintain the records.

15 I'm sure -- I don't inspect this
16 personally -- they have a well completion
17 abandonment record for each well that they do
18 because even when they circle a well they have
19 individual pages of what they have to do.

20 JUDGE WHITE: My understanding is
21 that many states require whenever you're
22 abandoning a well that you have some kind of
23 record of how deep it was and what you did.
24 And are you aware where the State of Wyoming
25 is going to require SEI to keep records and

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1 submit them to the state for some record
2 keeping?

3 MR. SAXTON: I'm not sure what the
4 state requirement is. I know our requirement
5 is that they maintain the records on file for
6 the life of the license. I don't know what
7 the state is.

8 But the state is pretty much more
9 proactive I would imagine from my interactions
10 with the state of making sure that the --
11 Especially the surface expression because
12 that's how as Hal Demuth had talked about that
13 for Wyoming if a wellfield is not disturbed
14 you can generally see where all expiration
15 drill holes were. Sometimes they have a mud
16 pit that's so visible, a metal detector. A
17 lot of them don't have that, but they do. But
18 you can see where it's disturbed.

19 And the state really is cognizant
20 of that because when you abandon it they want
21 to make sure that it goes back to natural
22 grasses and is not as disturbed as in the
23 future.

24 CHAIRMAN BOLLWERK: All right.
25 Anything further? Judge Cole, do you have

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1 anything further?

2 JUDGE COLE: No.

3 CHAIRMAN BOLLWERK: All right. At
4 this point is there anything further from the
5 parties than what we've heard? All right
6 then. I very much appreciate your testimony
7 this afternoon and I think you will be back
8 joining us probably in a couple of minutes.
9 Thank you again for the information you've
10 provided.

11 All right. I think we're to the
12 Joint Intervenors panel for Contention 3.
13 There will be two witnesses. While they're
14 coming up, let me just ask one question about
15 JTI005A and B[®]. What is your intent in terms
16 of trying to put those into the electronic
17 format?

18 MR. CRYSTAL: We have now filed
19 them while the day has progressed here.

20 CHAIRMAN BOLLWERK: Okay.

21 MR. CRYSTAL: In the last half
22 hour. So we've refiled those two as
23 instructed.

24 CHAIRMAN BOLLWERK: There they are.
25 Okay.

1 MR. CRYSTAL: And also a revised
2 exhibit list that conforms to how those
3 exhibits should be designated.

4 CHAIRMAN BOLLWERK: Terrific.

5 MR. CRYSTAL: If we could complete
6 the process in moving them into evidence that
7 would be terrific.

8 CHAIRMAN BOLLWERK: So I see them.
9 They have come up. That's the witness list
10 and the exhibit. I can't get into the -- Can
11 you get into them from my computer or are you
12 having yours?

13 (Off record comments.)

14 CHAIRMAN BOLLWERK: All right.
15 Why don't we go ahead and we'll identify those
16 and put them into evidence. And then we'll
17 turn to what we have to do with the two
18 witnesses.

19 We're looking at what are now going
20 to be identified as Exhibits JTI005A-R2 and
21 JTI005B-R2 which are JTI005A-R2 are NRC
22 database spreadsheets which are PDFs, so the
23 NRC data that are referenced. And then
24 JTI005B-R2 is representative PDFs of story
25 maps. And we will go ahead and mark those for

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1 identification.

2 (Whereupon, the above-
3 referred to documents
4 were marked as Exhibits
5 JTI005A-R2 and JTI005B-R2
6 for identification.)

7 Any objection to their admission
8 into evidence? No. Then we will go ahead and
9 admit them.

10 (Whereupon, the above-
11 referred to documents
12 marked for identification
13 as Exhibits JTI005A-R2
14 and JTI005B-R2 were
15 received into evidence.)

16 We've taken care of that. Let's
17 move onto the exhibits that go with these two
18 witnesses on Contention 3. And I believe
19 their testimony is already in. So we're
20 looking at if my count is correct JTI022 is
21 the first exhibit. All right. Let's do this
22 quickly and move on.

23 We're marking for identification
24 JTI022 which is a document authored by Curtis
25 and others in 2006, a simulation of reactive

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10 2010.

11 JTI046, John McCarthy, Manager,
12 author from the Safety Health and
13 Environmental Affairs, Division of Power
14 Resources, Smith Ranch Highland Uranium
15 Project, southwest area hydrologic tests, for
16 NRC License SUA-1548, February 21, 2007.

17 And I think that may be it. Three
18 more. JTI057 -- it looks like six more --
19 Gary Curtis' biography from USGS website.

20 JTI058, Fox, et al, from 2006, the
21 effect of calcium on aqueous uranium(VI)
22 speciation and adsorption to ferrihydrite and
23 quartz.

24 JTI059, Kelly, et al, 2006, X-ray
25 absorption spectroscopy identifies calcium-

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1 uranyl-carbonate complexes at environmental
2 concentrations.

3 JTI060, Yabusaki, et al, the author
4 is assessing the potential for power
5 restoration of Uranium Institute Recovery
6 sites.

7 JTI061, an article by Hua, et al,
8 2006 kinetics of uranium (VI) reduction for
9 hydrogen sulfide in anoxic aqueous systems.

10 And finally JTI062-R, groundwater
11 quality samples obtained from the Christianson
12 Ranch mine unit 5 excursion well 5MW66.

13 (Whereupon, the above-
14 referred to documents
15 were marked as Exhibits
16 JTI022-JTI026, JTI036,
17 JTI040-JTI046, JTI057-
18 JTI058, JTI060-JTI062-R
19 for identification.)

20 Okay. Anything I've missed? Are
21 we good?

22 MR. CRYSTAL: No, Your Honor.

23 CHAIRMAN BOLLWERK: Those are all
24 identified for the record. Let's go ahead and
25 admit them, starting with Exhibit JTI036.

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1 MR. CRYSTAL: Twenty-two I think is
2 the first.

3 CHAIRMAN BOLLWERK: Is that the
4 first one?

5 MR. CRYSTAL: Twenty-two.

6 CHAIRMAN BOLLWERK: Twenty-two.

7 Thank you. I'm admitting for the record
8 JTI022, JTI023, JTI024, JTI025-R, JTI026,
9 JTI036, JTI040, JTI041, JTI042, JTI043,
10 JTI044, JTI045, JTI046, JTI057, JTI058,
11 JTI060, JTI061, and JTI062-R. Anything I
12 missed? Are we good?

13 (Whereupon, the above-
14 referred to documents
15 marked for identification
16 as Exhibits JTI022-
17 JTI026, JTI036, JTI040-
18 JTI046, JTI057-JTI058,
19 JTI060-JTI062-R was
20 received into evidence.)

21 I thank you all for your patience
22 in allowing me to do that. And now we're
23 ready for the panel. By the way, gentlemen,
24 why don't you go ahead and introduce
25 yourselves. I think we forgot to do that for

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1 the record.

2 DR. ABITZ: Richard Abitz.

3 DR. LARSON: Lance Larson.

4 CHAIRMAN BOLLWERK: All right. And
5 you're both under oath and you continue to be
6 so. Thank you.

7 JUDGE WHITE: I have some questions
8 for these witnesses, but they pertain directly
9 to testimony that we just heard from the
10 staff. And so I'd like to postpone them until
11 the entire panel is seated. It seems like
12 that would be a better opportunity for the
13 discussion to be more productive than to just
14 have you folks sitting by yourselves. So
15 other than that I have no questions.

16 CHAIRMAN BOLLWERK: Judge Cole.

17 JUDGE COLE: That sounds like a
18 good plan.

19 CHAIRMAN BOLLWERK: All right. Let
20 me ask one question. We heard a lot of
21 testimony about the number of bore holes that
22 are existing, what have been filled and what
23 haven't been filled. Do you have any comments
24 on the information that we were provided
25 today? Any concerns you have about the

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1 numbers we were given.

2 DR. ABITZ: I don't so much have a
3 comment on the number given. But I still
4 believe that the FSEIS does not have
5 sufficient information to show how the well
6 holes will be plugged and abandoned properly
7 and how that will be verified and documented.
8 I didn't see in the FSEIS any forms that
9 showed what information is reported on a plug
10 and abandonment log.

11 CHAIRMAN BOLLWERK: So what you're
12 concerned about is they haven't provided us
13 with the logs that they use for doing this.

14 DR. ABITZ: Correct. We haven't
15 seen the information that's put on a plug and
16 abandonment log to see if sufficient cement
17 and bentonite was added to account for the
18 volume of the bore hole down to whatever the
19 horizon was.

20 CHAIRMAN BOLLWERK: All right. Dr.
21 Larson, is there anything that you have to say
22 about this?

23 DR. LARSON: I don't have a
24 comment.

25 CHAIRMAN BOLLWERK: All right.

1 Maybe that's one of the things we can discuss
2 with the next group. All right.

3 JUDGE COLE: One question.

4 CHAIRMAN BOLLWERK: Judge Cole, do
5 you have something? I'm sorry.

6 JUDGE COLE: So would you agree
7 that if properly done pumping tests can
8 reasonably ensure that vertical obscurities
9 resulting from unplugged boreholes are
10 unlikely to occur during mining?

11 DR. ABITZ: I'll answer that, Dr.
12 Cole. I don't believe that plugging and
13 abandoning bore holes are enough. Fluvial
14 stratigraphy by nature is very complex. And
15 as we heard from the NRC staff, it can thin
16 and be absent. Complying layers can be
17 absent. So plugging bore holes is not enough
18 to ensure that vertical excursions will not
19 occur.

20 JUDGE COLE: What else do you think
21 they should do?

22 DR. ABITZ: I think they need to
23 have a very detailed stratigraphic model
24 showing where the thinning horizons are in the
25 sand units.

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1 JUDGE COLE: All right. Thank you.

2 CHAIRMAN BOLLWERK: Judge White,
3 anything further?

4 JUDGE WHITE: No.

5 CHAIRMAN BOLLWERK: Anyone have any
6 cross examination questions given what we've
7 just asked?

8 MR. PUGSLEY: No, Your Honor.

9 MR. HARPER: No, Your Honor.

10 MS. ANDERSON: Your Honor, can we
11 have two minutes?

12 CHAIRMAN BOLLWERK: Why don't you
13 take five? Probably being a little optimistic
14 with two. I think five is more like it. So
15 we'll take a break for five minutes. Off the
16 record.

17 (Whereupon, the above-entitled
18 matter went off the record at 4:33 p.m. and
19 resumed at 4:39 a.m.)

20 CHAIRMAN BOLLWERK: Let's go on the
21 record for one second. We have received a
22 couple of sets of questions. So we're going
23 to go talk with Judge Cole and be back
24 hopefully in no more than 10 minutes. Thank
25 you. Off the record.

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1 (Whereupon, the above-entitled
2 matter went off the record at 4:39 p.m. and
3 resumed at 4:50 p.m.)

4 CHAIRMAN BOLLWERK: Can we go back
5 on the record please. We have a couple of
6 questions that the Board would like to posed
7 based on what we received from the parties.

8 The first one is for Dr. Larson.
9 given the data that you reviewed, do you have
10 an example of a vertical excursion at a site
11 that would be similar to what you might expect
12 to see at the Ross site?

13 DR. LARSON: By looking at the
14 historical critical excursions, we can see
15 that they're proportional. A lot of the
16 reports tell us that they're proportional to
17 the drilling intensity with respect to
18 historical well drills, the actual operational
19 drills.

20 So the data that I would most
21 likely point is stuff that I presented in my
22 story maps with respect to Smith Highland,
23 dozens of failed well casings which resulted
24 in contamination in the shallow aquifers. So
25 those were primarily less than 200 feet from

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1 the surface. That would primarily be the
2 source that I'd cite to with respect to that.

3 JUDGE WHITE: Those are failed well
4 casings in operating wells, not historical
5 wells.

6 DR. LARSON: So how that
7 contamination actually got there could be
8 multiple reasons. There's no kind of silver
9 bullet with respect to this is exactly how
10 this got elevated. We know that there's
11 probably multiple reasons or possible reasons
12 of why those concentrations were observed. To
13 the exact extent, we know it's proportional to
14 the drilling intensity.

15 CHAIRMAN BOLLWERK: Again, do you
16 want to provide us with any reasons? Or I
17 guess you basically said it could be multiple
18 reasons, right? Failed casings or?

19 DR. LARSON: Failed casings.
20 thinning geology, historical well holes.

21 CHAIRMAN BOLLWERK: All right.
22 Judge Cole, do you have anything on that? On
23 this question?

24 JUDGE COLE: No.

25 CHAIRMAN BOLLWERK: All right.

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1 Then if we could we'd like to pull up Exhibit
2 SEI014G and go to page 275. This is an
3 example from the Strata technical report of an
4 abandonment cementing worksheet. And I don't
5 know if you want to take a look at that. And
6 there are apparently at least 100 of these
7 sheets that are in this document.

8 Are those the sorts of things you
9 would anticipate providing you with the type
10 of information you would want to see?

11 DR. ABITZ: That is correct.

12 CHAIRMAN BOLLWERK: Okay.
13 Obviously, we're not going to go through them
14 all right now. But those are in the record.

15 Could you then pull up SEI014C?
16 I'm sorry. Page 41 and toward the bottom I
17 believe. I think it may be the next page
18 actually. Maybe not.

19 It says the details of the plugging
20 of each bore hole will be recorded on an
21 abandonment record, examples in the appendix,
22 which I think that's what we just looked at
23 which will be filed at the Oshoto Field Office
24 in the appropriate in the hole record and
25 provided with a respective wellfield data

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1 package.

2 If I understand what's being -- And
3 we can ask the folks from Strata about this
4 when we convene our big session after that.
5 But is the kind of access you would expect to
6 be able to find things at?

7 DR. ABITZ: That is correct.

8 CHAIRMAN BOLLWERK: Okay. And we
9 will ask them actually about what NRC's access
10 to those records is as well when we have the
11 -- So I just wanted to -- We were made aware
12 of that and we thought we ought to put that on
13 the record.

14 DR. ABITZ: Thank you.

15 CHAIRMAN BOLLWERK: Thank you. All
16 right. Anything else from the parties?

17 MS. MONTEITH: Your Honor, we had
18 one late question if it's possible.

19 CHAIRMAN BOLLWERK: A late filed
20 question.

21 MS. MONTEITH: Yes sir.

22 (Off record comments.)

23 CHAIRMAN BOLLWERK: Judge Cole,
24 we'll go back over in my office and we'll take
25 another five minute break. And we'll call

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1 over there in two minutes. Thank you. Off
2 the record.

3 (Whereupon, the above-entitled
4 matter went off the record at 4:57 p.m. and
5 resumed at 5:01 p.m.)

6 CHAIRMAN BOLLWERK: Can we go back
7 on the record please. Given the nature of
8 this question I think the better way to handle
9 this is go ahead and put all the witnesses
10 back on the stand which we were going to do
11 anyway. Then we'll have a little discussion
12 about bore holes. So if we could have all the
13 -- We don't have any more individual questions
14 for you all. Let's go ahead and have if we
15 can all the witnesses for Contention 3 come
16 into the witness area.

17 (Off record comments.)

18 So let's talk for a couple minutes
19 about bore holes and the way that they're
20 abandoned and the methods by which they are
21 abandoned and who know about it and who
22 doesn't, what records are kept.

23 Let's start perhaps with the folks
24 from Strata. You've heard that there's been
25 some testimony about bore hole records that

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1 you are required to keep by the State of
2 Wyoming. Can someone describe sort of how
3 that system works for you all? If we need to
4 pull up any exhibits, just let us know
5 different from what we've already shown.

6 MR. SCHIFFER: Judge, this is Ben
7 Schiffer. And I can tackle what was started
8 in the developing the license application if
9 that helps the Board. Briefly, I was
10 responsible for overseeing the plugging and
11 abandonment of some 55 exploration holes
12 around one of the monitor well clusters. And
13 those records were records that we have
14 brought up for Dr. Abitz to take a look at a
15 few minutes ago.

16 I think the interesting thing, a
17 couple of interesting things, about that
18 program is that when we entered those holes
19 with a drilling rig and it is with a normal
20 drilling rig just like we use for exploration
21 as well as well insulation. The thing that I
22 thought was interesting is that they actually
23 have to drill down to get to the total depth
24 of those holes.

25 Those holes are not open. Those

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1 holes over time have sealed themselves off to
2 some extent. So the drill rig/drill pipe
3 actually has to circulate and circulate water
4 as well as turns. So the drill pipe has to
5 turn. And I thought that was interesting.

6 The bore width of those holes are
7 now fully open and just literally a hole.
8 It's really a misnomer. Over time, the turns
9 tend to collapse and tend to swell and tend
10 plug these things off. I thought that was
11 interesting.

12 In fact, I think it's important to
13 note that virtually all holes in that radius
14 failed. That was also important. We were
15 able to find them. We were able to set a
16 drill rig up on them. And we were able to
17 reenter them and reabandoned them per the
18 standards that have today.

19 CHAIRMAN BOLLWERK: All right.
20 What are those standards?

21 MR. SCHIFFER: I apologize we don't
22 have the exhibit, but the quality division has
23 a chapter and regulations that oversees
24 abandonment of drill holes. And it's done in
25 particular for exploration programs. And it's

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1 reapplied at division chapter 8, yes, Land
2 Quality Division, Chapter 8. So that puts out
3 the details about how the wells are to be
4 abandoned.

5 And what it prescribes are plug gel
6 which is a viscous mix of router and
7 bentonite. It also prescribes bentonite grout
8 and we can also use sealant. So those are the
9 methods that Chapter 8 allows us to use.
10 Strata was very conservative in its license
11 application and included the use of both
12 bentonite grout and sealant as was one of your
13 procedures brought up previously for
14 abandonment of these holes.

15 MS. MONTEITH: Your Honor, if I
16 may. That exhibit to which he was referring
17 is Exhibit SEI013 for the record.

18 CHAIRMAN BOLLWERK: All right. And
19 in terms of your interaction with the Wyoming
20 Department of Environmental Quality could you
21 describe that? You heard something about how
22 the NRC staff approaches the inspections that
23 it does relative to bore holes. What is your
24 interaction with the Wyoming Department of
25 Environmental Quality both in terms of

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1 paperwork to do and any onsite inspections
2 that they might do?

3 MR. SCHIFFER: I can talk, discuss,
4 about what our perimeter monitor requires.
5 And as with evidence previously, the wellfield
6 packages for each well unit detailed plugging
7 and abandonment records as we've seen today an
8 example of in that package. So they also want
9 to know if it will and where these holes are
10 located and that we have re-entered them and
11 plugged them in accordance with the
12 requirements in our permit.

13 CHAIRMAN BOLLWERK: And so you said
14 they look at the well packages.

15 MR. SCHIFFER: Yes, Judge.

16 CHAIRMAN BOLLWERK: Do they come
17 onsite and do an onsite inspection like the
18 NRC apparently does from time to time?

19 MR. SCHIFFER: Yes, Judge.

20 CHAIRMAN BOLLWERK: And how often
21 is that? I think the NRC said theirs is semi-
22 annual.

23 MR. GRIFFIN: I can probably help
24 with that. DQ inspects it. They'll have at
25 least an annual inspection. But in the case

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1 of for instance the Lost Creek mine they're
2 inspecting them monthly. I would expect that
3 when we're in operation that we will probably
4 see them there monthly.

5 CHAIRMAN BOLLWERK: All right.

6 JUDGE WHITE: For the plugging and
7 abandonment of historical holes, does the
8 State of Wyoming require you to submit
9 paperwork such as we saw in your exhibit to
10 some state office for each hole?

11 MR. SCHIFFER: Judge White, the
12 wellfield package for each mining that we've
13 described go forth to NRC as well as the State
14 of Wyoming. And our requirements for the
15 agencies are virtually identical. So, yes,
16 they will be looking at those records in
17 detail during review of the individual mine
18 unit hydrogeologic packages.

19 JUDGE WHITE: So there is some kind
20 of a bore hole record for each bore hole,
21 historic bore hole, Nubeth hole, that you guys
22 plugged with this information we saw on it.

23 MR. SCHIFFER: Yes, that is
24 correct.

25 JUDGE WHITE: Thank you.

1 CHAIRMAN BOLLWERK: Let me see if
2 the NRC staff has anything further they want
3 to say on this subject. And then we'll go to
4 the Joint Intervenor witnesses.

5 MR. BURGESS: The only thing which
6 we would like to add is that this information
7 is contained in FSEIS on page 443. Sorry,
8 page 442. We talk about breaches to the
9 integrity of the confining unit and we
10 describe about the hole plugging and then
11 cross refer to Strata 2011B which is the
12 technical report. And it also cross
13 references the SEIS 2.1 which in turns
14 references the Wyoming DEQ regulations.

15 CHAIRMAN BOLLWERK: Anybody have a
16 citation for the exhibit number that we're
17 talking about?

18 MS. MONTEITH: Exhibit number would
19 be SEI009. We're looking for the PDF page
20 number right now.

21 MR. PUGSLEY: It's SEI009A, 316.

22 CHAIRMAN BOLLWERK: All right.
23 Anything further the staff wants to say? Let
24 me turn then to the witnesses for the Joint
25 Intervenors. Is there anything further you

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1 want to say on the subject of bore hole
2 abandonment?

3 DR. ABITZ: Just one final comment
4 on this.

5 CHAIRMAN BOLLWERK: Sure.

6 DR. ABITZ: Or not final comment
7 but one comment based on our filed testimony.
8 There's a disturbing statement that brought
9 this up in the FSEIS on page 337. It says
10 "The applicant will attempt to locate and
11 properly abandon all historical drill holes."

12 So there does not seem to be any
13 teeth in making sure that happens. And
14 because there are no teeth to make sure that
15 happens, the FSEIS conclusion that the impact
16 will be low is really unfounded unless there
17 is some way to demonstrate that that will
18 indeed occur.

19 CHAIRMAN BOLLWERK: Let me ask
20 staff a question. Given that license
21 condition which I understand you believe is
22 risk-based, if they have attempted to fill
23 bore holes and we're a year down the road and
24 you find another one, what are you going to
25 do? They've attempted it, but guess what?

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1 They weren't totally successful.

2 MR. SAXTON: But we're going to
3 require a good faith effort. And if they just
4 go out and say "We sent a couple of students
5 on Saturday afternoon to locate them using a
6 metal detector," that's not a good faith
7 effort. If they try to locate them versus GPS
8 and a backhoe and they still can't locate them
9 all and then eventually there is something
10 that's identified, we would look at it and
11 make sure that it wasn't one of those things
12 where they said they were going to try to
13 attempt and they didn't fulfill their
14 commitment.

15 CHAIRMAN BOLLWERK: Would they be
16 subject to enforcement action?

17 MR. SAXTON: Only if it's willful.
18 And that's a little bit harder. They may be
19 subject to violation, but again that's going
20 to be more difficult too because of the way
21 the license condition is written. We
22 indicated that make good faith effort.

23 The enforcement action generally
24 you have to go through the enforcement
25 division and that's more involved as far as

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1 willful or some other.

2 CHAIRMAN BOLLWERK: When you said
3 they might be subject to a violation, is that
4 different from enforcement action?

5 MR. SAXTON: Yes, you can get a
6 violation from not -- For instance, if you
7 didn't report your F-1 limits regularly or on
8 time and you go out there and inspect and we
9 see that you didn't file it, you'll get a
10 violation. What happens when you get a
11 violation, generally it's a level 4 which is
12 the lowest level. But you have to address
13 that.

14 Usually when you go on an
15 enforcement, it involves a lot more than --
16 You have to show some sort of criminal intent
17 or willful disregard and that sort of thing.

18 CHAIRMAN BOLLWERK: Does a
19 violation get reported to the NRC Office of
20 Enforcement?

21 MR. SAXTON: I don't know the exact
22 procedure. But it gets reported in the
23 inspection report. We would have to
24 acknowledge it and then you would have to have
25 some corrective active or root cause and show

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1 us that this won't happen again.

2 MS. MONTEITH: Your Honor, I don't
3 believe that our witnesses are qualified to
4 testify to the enforcement process. That
5 falls in a different division of the NRC.

6 CHAIRMAN BOLLWERK: Well, it
7 appears that he knows something about it. So
8 we'll take what he's given us. Thank you.

9 MS. MONTEITH: It may not be
10 accurate.

11 MR. GRIFFIN: Your Honor, may I add
12 to that as far as to the identification of the
13 bore holes and plugging in?

14 CHAIRMAN BOLLWERK: Okay.

15 MR. GRIFFIN: I believe that
16 license condition is worded the way it is and
17 we will attempt to locate them is recognizing
18 that there are a large number of holes out
19 there. And we may not be able to find every
20 single one of them.

21 But if we aren't able to find them
22 before we do a pump test, they should show up
23 in that pump test. If they do not and we were
24 to go into operation, the concern here is that
25 they would cause a vertical excursion.

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1 We have a license condition that if
2 we have a vertical excursion we have to stop
3 injection in that mine unit until we determine
4 the cause of it. So we have layers of defense
5 there if there is a bore hole that gets by us.

6 CHAIRMAN BOLLWERK: Okay.

7 MR. DEMUTH: Judge, if I might add
8 to that. There seems to be a slight
9 presumption that bore holes that are a problem
10 exist. And if I might, we've done over 40 of
11 these pump tests. We do not have bore holes
12 that are a problem. The exception is that you
13 do.

14 So I would suggest we have geologic
15 information. We have hydrologic information
16 wherein we show differences in water levels
17 between formations. That in itself if we had
18 bore holes that were already free-flowing
19 communication we would not see differences in
20 water levels.

21 So we have multiple lines of
22 evidence to suggest that we don't have a
23 problem. And then as Mr. Griffin said, we
24 also will do a pump test as well.

25 CHAIRMAN BOLLWERK: All right.

1 Yes.

2 MS. MOORE: Your Honor, I would
3 just like to add that the SEIS does not assume
4 that all the bore holes will be plugged and
5 there would be no excursions. The SEIS does
6 account for the fact that there could be
7 excursions due to confinement issues or bore
8 holes. And we take that into account when we
9 make our impacts determination.

10 CHAIRMAN BOLLWERK: All right.
11 Again, I think the problem from the
12 Intervenors' perspective to paraphrase Yoda
13 "There is no try. There is do." And I think
14 they want to make sure that it gets done. But
15 that's where we're at here.

16 Anything further that the Joint
17 Intervenors' witnesses want to say on the
18 subject?

19 DR. ABITZ: Nothing at this time.

20 CHAIRMAN BOLLWERK: Okay. Judge
21 Cole, anything that you'd like to say?

22 JUDGE COLE: No. You've generally
23 covered it.

24 CHAIRMAN BOLLWERK: All right.
25 Judge White, anything you have on this subject

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1 or something else if you want to change the
2 subject here?

3 JUDGE WHITE: No. You've already
4 said you had no further comment. I was just
5 going to ask before Intervenors' witness
6 brought it up whether you would consider the
7 preproduction pump test as an demonstration.

8 Your statement was that attempt to
9 abandon indicated that there would be no
10 demonstration of completion. Would you agree
11 though that the pump test is a way to
12 demonstrate whether or not there are abandoned
13 wells within the site?

14 DR. ABITZ: I will state again what
15 I stated in my testimony that a pump test of
16 a short duration such as 72 hours and even a
17 week is really no demonstration of no
18 connectivity between the horizons when you're
19 running an extraction process in a wellfield
20 for two or three years. So I stand on that.
21 There's no science presented that shows there
22 will be no communication between the aquifers
23 when you run a production center for two or
24 three years.

25 JUDGE WHITE: So you would

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1 disagree.

2 DR. ABITZ: I would disagree,
3 correct.

4 JUDGE WHITE: That's all I'm trying
5 to establish. Thank you.

6 There are just two things that I
7 wanted to ask. I'll actually start with
8 Intervenors' witnesses because I did mention
9 that I wanted to give you folks a chance to
10 comment on some of the testimony that staff
11 offered earlier. And two in particular, but
12 I'll start with one, I would like to know if
13 you have any comments on Dr. Burgess' analysis
14 of the hydrologic effects that might be
15 expected if in fact there were unlocated and
16 unplugged bore holes within the mining area.

17 DR. ABITZ: The only comment I
18 would have on Dr. Burgess' analysis was really
19 with a follow-on from NRC staff. I noted that
20 even though there is a flow into the
21 extraction wells, the injection wells if they
22 plug, could build up enough pressure where
23 there would be a potential for a vertical
24 excursion in that area. So that would still
25 open the door for vertical excursions around

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1 injection zones if there were problems. So I
2 would keep that open.

3 JUDGE WHITE: Despite the
4 hydrologic head in the upper aquifer as was
5 pointed out by Mr. Saxton that those
6 excursions could still happen.

7 DR. ABITZ: Correct. I have not
8 seen what the pressures could build to if
9 there was plugging. I do not know at what
10 pressure they would shut off the well and if
11 that pressure would exceed the 100s -- I
12 forget what the unit was, but approximately
13 100 in the SM over the ore zone. So we don't
14 have data in the FSEIS to my knowledge to
15 evaluate that scenario.

16 JUDGE WHITE: Or assuming that
17 unplugged bore holes will exist, but it's
18 important to understand what the effects of
19 them would be if they did exist. Any comments
20 from staff to follow?

21 MR. BURGESS: Yes. If I could just
22 add to that. The problem with injection bore
23 holes when they do lose some of their capacity
24 is that you get the plugging very close to the
25 well bore. It doesn't extend very far out

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1 from the well bore in general. So those high
2 pressures would be restricted to a very
3 limited area around that injection well bore.

4 JUDGE WHITE: Any follow-up?

5 DR. ABITZ: My follow-up on that
6 would be we still see vertical excursions and
7 there's a reason for that. I can't put my
8 finger on exactly what the mechanism is. We
9 know it could be unplugged bore holes. We
10 know it could be bad casings. We know it
11 could be thinning of the units.

12 The record shows there still are
13 excursions. So although many of them may be
14 controlled with the methods being discussed
15 here, it's not failproof.

16 JUDGE WHITE: Any other comment on
17 that particular issue?

18 MR. BURGESS: I think the only
19 comment is that as Ms. Moore indicated the
20 potential for excursions has been included in
21 the FSEIS.

22 JUDGE WHITE: My next question
23 again is an opportunity for Intervenors'
24 witnesses to comment on Dr. Johnson's analysis
25 of the experimental studies reported by Fox

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1 and others in Joint Intervenors' Exhibit 058.

2 DR. LARSON: I'd like to comment.

3 I have two comments on Dr. Johnson's
4 interpretations of those studies. First, the
5 study that was referenced in the previous
6 testimony, essentially what they were doing
7 was under pristine conditions. So they were
8 taking these batch reactor systems and running
9 them under various conditions.

10 Essentially, you have ferrihydrite
11 cores and you kind of stress test these under
12 various conditions and you see how that
13 behaves. Under those conditions, they saw
14 that when it's in this phase when you have a
15 bunch of calcium and a bunch of carbonite what
16 happens is it complexes and it becomes
17 unreactive.

18 Now when we take that out to the
19 field system where it's substantially more
20 complex, you have to think about you don't
21 have peer phase ferrihydrite or you
22 potentially could or you potentially couldn't.
23 You don't really know. It could be different,
24 iron hydroxide. The type of iron hydroxides
25 are incredibly complex of what's in the actual

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1 environment. So that's the first point I
2 wanted to make on that.

3 The second point is that we know
4 these systems are very complex. And the
5 reason that we do research and the reason that
6 we study these things in laboratory
7 experiments is that we want to develop models.
8 So we use this data from this research to
9 develop models to try to understand and
10 explain these complex systems so that we can
11 better make decisions.

12 That's why we do these models and
13 these predictions so we can kind of use those
14 predictions to help us make better decisions
15 with respect to how these systems are actually
16 behaving. That's my comments on her
17 testimony.

18 JUDGE WHITE: Dr. Johnson.

19 DR. JOHNSON: Yes. I would just
20 like to make sure that it's understood that in
21 these experiments which I agree are controlled
22 experiments in the laboratory with pure phases
23 they showed that by changing these parameters
24 you could alter the degree of reactivity. But
25 in no case did they alter the parameters such

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1 that they created a nonreactive uranium
2 species so that there was no adsorption.

3 And I agree wholeheartedly that
4 these studies are done to further understand
5 and further refine our knowledge on these, on
6 uranium and how it behaves in the natural
7 geochemical system. And furthermore, I think
8 it's very likely that the studies that are
9 being done now, both currently and
10 contemporary, will at some point inform best
11 practices when it comes to restoration, in the
12 wellfield pattern itself between the
13 production and injection well because we're
14 understanding more and more about that.

15 But where I disagree that these
16 studies don't show that uranium is a
17 nonreactive species. Therefore, it would make
18 a good indicator parameter for excursions.

19 JUDGE WHITE: Do you have a reply?

20 DR. LARSON: I would disagree with
21 that and especially since we don't have the
22 data to look at to see if there's even any
23 ferrihydrite bore cores and even some of these
24 systems know where it's even at, what type of
25 geology, what type of mineralogy. Making

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1 claims with respect to that it's nonreactive
2 without having the essential data collected,
3 it's a difficult claim to make.

4 JUDGE WHITE: Any other comment on
5 that issue?

6 DR. JOHNSON: Yes, Judge White.
7 I'd just like to say that the idea that
8 there's no core is hardly realistic
9 considering the materials out there. And iron
10 hydroxide is ubiquitous in these kinds of
11 settings.

12 I agree that there's a lot of the
13 details in terms of exactly how much and where
14 and different nuances on the mineralogical
15 form and how much calcite goes along with it
16 and so on. We certainly don't know that and
17 it changes from spot to spot as you go on.
18 But we certainly understand in general what
19 minerals are in these sediments.

20 DR. LARSON: Dr. Johnson is exactly
21 right. It does change. It's highly variable
22 in some of these systems. And she's also
23 right in saying that with respect to some of
24 these minerals it depends on what type of
25 minerals are there. And that has significant

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1 implications with respect to how they interact
2 with certain species in the water.

3 You can have different types of
4 iron hydroxides that will react completely
5 different with uranium. We know that from the
6 literature. So we can use some of this
7 information and collect some of this data that
8 would help assess some of these situations.

9 JUDGE WHITE: Any other comment on
10 this issue?

11 DR. ABITZ: If I could comment on
12 two things with respect to this discussion on
13 uranium. We have discussed this before. The
14 first is we have to look at the historical
15 record. Excursions occur very frequency at
16 ISL mining sites. So uranium does make it to
17 the monitor well ring and beyond. And we also
18 discussed the fact that these sites become
19 saturated and uranium continues to pass by
20 once those adsorption sites are saturated.

21 And what we don't have here are
22 data from the Ross mining project that shows
23 what the capacity is in the aquifer for
24 adsorption of uranium and how that compares
25 with the expected concentrations and durations

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1 of lixiviant injection to come up with a mass
2 bounds here on what sites are available and
3 what concentrations would potentially reach
4 the monitor well ring. Data shows that
5 uranium gets out.

6 So without that kind of data to
7 really assess this, we can talk about all the
8 studies we want. But the bottom line is we
9 don't have data to look at this in a
10 quantitative fashion for the Ross project.

11 DR. JOHNSON: Judge White.
12 Contention 3 addresses the appropriate
13 indicator parameters that are used to detect
14 excursions. And certainly the record shows
15 and there's been several brought into exhibits
16 that there are certain situations that have
17 been on excursion status for a certain amount
18 of time and elevated uranium is measured in
19 those wells.

20 That's not the point here as I see
21 it. The point is really what's the best and
22 appropriate indicator parameter. And I think
23 that our testimony, both our direct and
24 rebuttal, has shown that uranium is not the
25 best indicator. There are others that are

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1 better like chloride and electroconductivity
2 and alkalinity.

3 But also in several of the examples
4 that were discussed by the Intervenors that
5 showed uranium in these excursion wells, the
6 record also shows that they weren't detected
7 on the basis of uranium. The conventional
8 excursion parameters were used to detect the
9 excursion.

10 And then during the course of that
11 well being on excursion status -- and Mr.
12 Saxton can explain some of the details about
13 the complexities and so on -- uranium did show
14 up. But in all cases they were recovered and
15 the uranium concentrations declined in
16 accordance with that recovery process.

17 DR. ABITZ: If I could respond to
18 that. We heard a bit earlier Dr. Johnson
19 talked about sulfate and alkalinity not being
20 perhaps the best excursion indicators because
21 they are reactive. They can form
22 precipitates. But their concentrations are
23 far enough elevated in lixiviant compared to
24 the monitor well ring that they would still be
25 good indicators. And that is exactly the case

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1 with uranium also.

2 Even if there is minor adsorption
3 of uranium as it makes its way to the perimeter
4 monitor well ring, some of those monitor well
5 rings are going to have levels of uranium that
6 are below detection when the amount of uranium
7 in leachate can be 100 milligrams per liter.
8 So we're talking four or five orders of
9 magnitude higher difference here. If the
10 logic is that sulfate and chloride can still
11 be used, then that logic applies to uranium,
12 too.

13 DR. JOHNSON: Judge White, to be
14 clear, there are reactions that can affect
15 alkalinity and sulfate. They don't even --
16 Those reactions in this type of environment,
17 in this type of geochemical environment, in my
18 opinion wouldn't even come close to the
19 reactivity that you could see with uranium.

20 Now these are within the controlled
21 studies and so on. They show up to 80 some
22 percent adsorption. The field study in
23 wellfield A shows the retardation of uranium.
24 That retardation happens pretty close to that
25 production well that is of concern. And even

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1 after all this time they've not shown up in
2 those monitoring wells.

3 Even though I appreciate the
4 studies that are being done to try to
5 understand in more detail the adsorption and
6 the complexation of uranium, we're not even
7 close to turning that into a very predictive,
8 dependent and reliable excursion parameter.

9 DR. ABITZ: Again, I professionally
10 disagree with Dr. Johnson because uranium has
11 been used as an excursion indicator in the
12 past. And we haven't seen any numbers to show
13 what the ratio is of sulfate and alkalinity in
14 the lixiviant compared to the monitor well
15 ring. And then in that ratio number of
16 whatever it is, 100 or 1,000 it's higher than
17 what uranium would be at the monitor well
18 ring. So until we see that kind of
19 information, I don't believe that the book is
20 closed on this.

21 JUDGE WHITE: Is the book closed on
22 this discussion?

23 MR. GRIFFIN: Your Honor, may I add
24 a little bit of information?

25 JUDGE WHITE: Of course.

1 MR. GRIFFIN: NRC did a report in
2 2009. They looked at groundwater impacts from
3 ISL mining. And one of the things they looked
4 at was excursions. Now it's been said that
5 there are many excursions caused by these
6 operations.

7 Just to put some numbers to that,
8 this is SEI004B. At the time of this report,
9 COGEMA Irigaray Christianson Ranch which is
10 currently Willow Creek had had 31 excursion
11 events. Peer Smith Ranch Highland had had 12.
12 And we're talking about horizontal excursions.

13 CHAIRMAN BOLLWERK: What page are
14 you reading from?

15 MR. GRIFFIN: I'm sorry. It's page
16 seven in the document. I think it's PDF page
17 seven also.

18 CHAIRMAN BOLLWERK: All right.

19 MR. GRIFFIN: And on page eight,
20 Crow Butte had had 20 excursions. So these
21 are infrequent occurrences. We have shown
22 that we can pull them back when they do occur.

23 Also as related to the question on
24 whether uranium should be an excursion
25 indicator, I'm not sure it's been mentioned up

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1 to this point. But the State of Wyoming
2 requires that if we have an excursion that we
3 haven't recovered within 30 days, we need to
4 run a full sweep, a full Guideline 8 sweep,
5 which includes uranium.

6 So if it's a quick hit with
7 chloride and we pull it right back in the next
8 sample, then they're not going to go make us
9 do that sample. But if it goes 30 days, we're
10 going to look at everything that's there, not
11 just chloride and alkalinity and conductivity.

12 JUDGE WHITE: Any follow-up on
13 those comments? Anything else that you have
14 to discuss here?

15 CHAIRMAN BOLLWERK: Judge Cole, do
16 you have any follow-up for the panel? Judge
17 Cole?

18 JUDGE COLE: Yes.

19 CHAIRMAN BOLLWERK: Do you have
20 anything for the panel?

21 JUDGE COLE: No.

22 CHAIRMAN BOLLWERK: All right. I
23 think I do not as well. At this point, I
24 believe that we've have completed this portion
25 of Contention 3 and with the testimonial

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1 portion of our proceeding.

2 Before you all stand up and run
3 off, let me take one second to thank all of
4 you on behalf of the Board. The information
5 you provided us over the last two days has
6 been extremely useful to us in deciding the
7 difficult issues we have to decide in this
8 case. And I know you've all been forthright
9 with us.

10 And the discussions we've had
11 especially in the larger groups have been very
12 professional and evenhanded. And we do
13 appreciate that from all of you.

14 JUDGE WHITE: Thanks, too, to all
15 of you.

16 CHAIRMAN BOLLWERK: Your service to
17 the Board, we appreciate it very much. Thank
18 you very much all of you. All right.

19 Let's talk with counsel for a
20 couple of seconds. In terms of schedule, I
21 think at this point we're pretty much caught
22 up with all the exhibits in terms of
23 everything that's been revised. We do have a
24 couple of dates we need to be made aware of.

25 The first one we've put the

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1 transcript in for three days. So I'm assuming
2 this is Wednesday, right. Probably Monday
3 we'll be getting this in. And probably on
4 Friday, you'll get yesterday's transcript in.

5 So why don't we look for any
6 transcript corrections by Tuesday, October
7 14th. That gives everybody a week. You
8 should be aware I guess that Monday is --

9 MS. ANDERSON: Your Honor, just to
10 clarify that the transcript will be filed in
11 the electronic filing system.

12 CHAIRMAN BOLLWERK: Yes. We'll put
13 it into the electronic file, the electronic
14 hearing docket. Yes. So Tuesday, October
15 14th, would be for transcript corrections.
16 Two things I would ask you. Actually, three
17 things I would ask you to look at carefully.

18 One is the exhibits. If there are
19 any questions in the transcript about the
20 status of an exhibit, make sure you bring that
21 to our attention.

22 The second thing is particularly in
23 looking at transcript corrections if you see
24 the -- There were a lot of folks up here. I'm
25 sure the court reporter is doing the best he

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1 can. But if you see what you think is mis-
2 attributed testimony in one of these larger
3 groups or otherwise, make sure that that's
4 something you bring to our attention.

5 The third thing I would say is
6 we're not here to write the transcript. You
7 might have wished you would have said --
8 There's a lot of things I probably wished I
9 would have said a little better. Just go
10 ahead and make corrections. Obviously, if
11 there's a not missing or no missing, something
12 is incorrect. But don't try to go ahead and
13 add any terms and making it sound better.
14 Everybody's prose could be a little bit
15 improved.

16 MR. FETUS: Your Honor, just to
17 clarify. Would you like us to file a notice
18 if there is something significant or just to
19 submit our corrections to everybody?

20 CHAIRMAN BOLLWERK: Actually, what
21 I think is you're getting to the point I was
22 just going to get it. If we could arrive
23 hopefully for the most part at joint
24 transcript corrections that would be the
25 optimum. If everyone can share them and if we

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1 have no objections to them, it makes it very
2 easy for the Board to adopt them.

3 If you find that the 14th is not
4 enough time for that because there is some
5 delay with the transcript or whatever, let us
6 know. But let's try to stick with that date
7 because it would be the Board's intention
8 assuming that everybody is happy with the way
9 of the status of the exhibits and with the
10 transcript corrections to close the record
11 shortly after that. That's where we'd be
12 headed.

13 Any questions about the transcript
14 corrections? Again, do the best you can. But
15 it isn't really necessary to rewrite the
16 transcript. And there are some folks that
17 seem to want to do that. And it's really not
18 useful.

19 We do want to make it accurate as
20 we can, not necessarily to make it a good read
21 which is what it is. We said it and we've got
22 to live with it.

23 In terms of the proposed findings
24 of fact, the general schedule that we've had
25 for some time indicates that those are due on

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1 Monday, November 3, 2014. Response of
2 findings of fact are on Monday, November 17,
3 2014.

4 And then I believe the Board's date
5 of issuing a decision is in early January
6 which let's see if I can find the date really
7 quickly. It's I believe January 9, 2015.

8 I should tell you that for some
9 reason we're not going to meet that date we
10 will go on the record and let the Commission
11 know and you know that there's a delay of some
12 length. But we are going to do our best to
13 make that date. Again, January 9th or
14 thereabouts is when we hope to issue something
15 in this case in terms of the initial decision.

16 I'm trying to think if there is
17 anything else we should anticipate. Anything
18 that any of the counsel has in procedural
19 concerns about anything at this point?

20 MR. PUGSLEY: No, Your Honor.

21 MR. HARPER: No, Your Honor.

22 CHAIRMAN BOLLWERK: No. All right.

23 MR. FETUS: No, Your Honor.

24 CHAIRMAN BOLLWERK: All right. On
25 behalf of the Board I would like to thank all

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1 of you as we thanked the witnesses. You all
2 put a lot of work into this case clearly.

3 The initial statements of position
4 and the rebuttal statements indicated that you
5 obviously thought through your positions very
6 clearly. You've done the best you can I think
7 to support it with the evidence you believe
8 will carry the day for you. In the end, we'll
9 see how that works out.

10 But I think you all have done what
11 you could do to put the best case in front of
12 the Board that you could. We very much
13 appreciate your efforts. And we'll try to do
14 the best we can to make a decision that even
15 if you don't agree with it you'll find
16 something that makes some sense. You can then
17 take it to the Commission. In the end,
18 they're the ones that decide whether we're
19 correct or incorrect. That's the way the
20 system works.

21 With any of these proceedings,
22 there's a lot of people that are involved in
23 the background and sometimes in the foreground
24 depending on how the technology is working.
25 And I want to acknowledge a couple of those

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1 folks right now.

2 Kathleen Schroeder and Alana Wase
3 are law clerks. One has been over there
4 putting up the exhibits and the other one has
5 been over there keeping track of what's going
6 on with the Go To Meeting that we've been
7 doing with Judge Cole back in Rockville as
8 well as a number of other things, both to
9 them. And we couldn't have done this without
10 them. We very much appreciate their efforts.

11 Karen Valloch, our administrative
12 assistant, who is back there someplace. If
13 you have a glass of water in front of you, you
14 can thank Karen as well as having this meeting
15 area as well. She's done a tremendous job
16 putting together and making sure that we can
17 all come together in an environment that I
18 think has been conducive to having the
19 hearing.

20 The concrete floors are
21 interesting. They actually talked about
22 getting some carpet in here for next time.
23 But that probably won't be for us, but whoever
24 the next person in here is.

25 Joe Deucher and Andy Wilkie are IT

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1 specialists. Andy is in Rockville helping
2 Judge Cole. Joe is over here behind the table
3 that you see. We do use some technology here.

4 Judge Cole, were you satisfied with
5 the way things worked out more or less?

6 JUDGE COLE: More or less.

7 CHAIRMAN BOLLWERK: More or less.

8 Okay, we'll go with that. We did have some
9 hitches from time to time. You heard the
10 problems we had with the speakers.
11 Apparently, we found that the NRC's system for
12 doing conference calls and the one they had
13 here were conflicting with each other and
14 that's why things were coming and going. But
15 we solved that problem in the end. But we
16 couldn't have done it without Joe and Andy and
17 we really appreciate their efforts.

18 The court reporter, Brandon
19 Paterson, we appreciate your efforts as well.
20 In the end, hopefully, we'll get a great
21 transcript and everyone will be happy with it.

22 Our folks from NRC Security, Gary
23 Simpler and Dennis Brady, who provided us
24 support here to make sure that we were all
25 secure, both here and on our limited

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1 appearance session out at Sundance. We
2 appreciate them coming and spending the time
3 with us and making sure that everything went
4 smoothly.

5 They were able to help us through
6 the Campbell County Sheriff's Department and
7 Captain Roy Seeman to get Corporal Paul
8 Pownall -- I'm going to mispronounce it -- P-
9 O-W-N-A-L-L. We'll get it spelled right in
10 the record anyway. Office Janaia, J-A-N-A-I-
11 A, Mueller and Officer Dan Maul who were all
12 here for two days supporting us. Thank you
13 very much for your efforts. We had no reason
14 for concern here in terms of the safety and
15 security of what we were doing.

16 And then here at the CAM-PLEX
17 facility which I frankly found to be very good
18 in terms of the purpose for which we were
19 putting it, Barbara Steele Stuart, S-T-U-A-R-
20 T, who is the marketing coordinator who worked
21 with Karen a lot in setting this up.
22 Recently, she's been replaced by Alicia
23 Torres, the Assistant Facilities Coordinator,
24 who's done a lot of work in helping us out.
25 I think one of the things she did was help you

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1 all find alternate quarters. She was very
2 helpful in doing that.

3 And then the technical folks for
4 the Technical Director Adam Skoglund, S-K-O-G-
5 L-U-N-D, and all the others, two or three
6 folks, that we had in here trying to get this
7 whole thing to work together in terms of the
8 monitors, the AV, all the things that you saw
9 and we used. I think it worked pretty well on
10 the whole. We really appreciate their
11 efforts.

12 Anything you want to say, Judge
13 White?

14 JUDGE WHITE: Just to echo my
15 thanks to all the folks you mentioned and to
16 the witnesses and counsel.

17 CHAIRMAN BOLLWERK: Judge Cole, are
18 you there?

19 JUDGE COLE: Thanks for your help.
20 Much appreciated.

21 CHAIRMAN BOLLWERK: All right. I
22 think Judge Cole, it's going on 8:00 p.m. out
23 there. I think he's ready to call it a day.

24 And again, I know the effort that
25 you all put into this, a lot of effort. We

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1 really appreciate what you put in front of us.
2 It's been a good hearing I think. And now the
3 onus is on us to do something with all the
4 information you provided.

5 Again, we thank you. Just as a
6 last reminder, those that are going on the
7 site trip tomorrow, it's still set for 8:00
8 a.m. Is that correct? Is it still on?

9 MR. KNODE: Yes. We should discuss
10 it after the hearing.

11 CHAIRMAN BOLLWERK: We'll take that
12 offline. If we do it, it should be at 8:00
13 a.m. at the Strata offices. But maybe that's
14 not going to happen. We'll talk about that
15 offline. But in any event, thank you all and
16 at this point we stand in recess. Thank you.
17 Off the record.

18 (Whereupon, at 5:46 p.m., the
19 above-entitled matter was concluded.)
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