

1 A P P E A R A N C E S :

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ILLINOIS POLLUTION CONTROL BOARD
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Chicago, Illinois 60601
(312) 814-3900

5 BY: Ms. Amy C. Antonioli, Hearing Officer
Mr. G. Tanner Girard, Ph.D., Board Member
6 Mr. Thomas E. Johnson, Board Member
Mr. Anand Rao, Board Staff
7 Ms. Alisa Liu, Board Staff

8

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11 BY: MR. JEFFREY C. FORT

12 Appeared on behalf of Water Remediation
Technology, LLC;

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15 ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,
1021 North Grand Avenue East
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18 BY: MS. DEBORAH J. WILLIAMS
MS. STEFANIE N. DIERS

19 Appeared on behalf of the Illinois
Environmental Protection Agency;

20

21 GARDNER, CARTON & DOUGLAS,
191 North Wacker Drive
22 Suite 3700
Chicago, Illinois 60606-1698
23 (312) 569-1441

BY: MR. ROY M. HARSCH

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Appeared on behalf of the City of Joliet.

1 A P P E A R A N C E S :

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ALSO PRESENT:

3

Dr. Theodore G. Adams

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Dr. Brian D. Anderson

Mr. Charles Williams

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Mr. Robert G. Mosher

Mr. Jerry Kuhn

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Mr. Blaine Kinsley

Mr. Jeff Hutton

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Ms. Sarah Adams

Mr. Doug Dobmeyer

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Mr. Dennis L. Duffield

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1 HEARING OFFICER ANTONIOLLI: Good
2 afternoon everybody, welcome to the Thompson
3 Center. My name is Amy Antoniolli, and I've
4 been appointed hearing officer in this
5 Illinois Pollution Control Board rulemaking.
6 The Board has captioned this proceeding In
7 The Matter Of: Revisions to Radium Water
8 Quality Standards: Proposed New Illinois
9 Administrative Code 302.307 and Amendments to
10 35 Illinois Administrative Code 302.207 and
11 304.525 which the Board has docketed as
12 R04-21.

13 In this proceeding the Agency is
14 seeking to amend the Board's radium water
15 quality standards. The rulemaking was filed
16 on January 13th, 2004 by the Illinois
17 Environmental Protection Agency. The Board
18 accepted the proposal for hearing on
19 January 22nd, 2004 and today is the fourth
20 hearing. The first hearing took place on
21 April 1st, 2004 at the Thompson Center, the
22 second hearing took place on May 6th at the
23 Board's offices in Springfield, the third
24 also took place in Springfield on August

1 25th, and then we're here today.

2 To my right is Member Tom Johnson
3 and seated to the right of Member Johnson is
4 Member Tanner Girard and seated -- oh, we
5 don't have Andrea with us yet. Okay. Also
6 here from the Board today is -- from the
7 technical unit is Mr. Anand Rao and this is
8 Alisa Liu.

9 If you would like to testify
10 today, I've put a sign-up sheet at the back
11 of the room. Also at the back of the room
12 are copies of the service list and a notice
13 list and the Agency's statement of reasons
14 for the proposal. Today's proceeding is
15 governed by the Board's procedural rules; all
16 information that's relevant and not
17 repetitious or privileged will be admitted
18 into the record.

19 At the last hearing we heard
20 testimony from Water Remediation Technology
21 Environmental's two witnesses, Mr. Adams and
22 Mr. Williams, which was followed by questions
23 by the Agency. Mr. Harsch was in the process
24 of questioning the WRT witnesses when this

1 hearing was adjourned last time and for this
2 hearing WRT Environmental has pre-filed
3 testimony for additional testimony from
4 Mr. Adams and the testimony for two new
5 witnesses, Dr. Brian Anderson and Ms. Angela
6 Tin, for today's hearing.

7 For readability purposes and
8 efficiency, we thought we'd continue where we
9 left off with questions, if there's no
10 objections, by Mr. Harsch.

11 MR. HARSCH: We would prefer if you
12 would let WRT proceed with their additional
13 testimony, I think some of those points
14 they're making clarify prior testimony and
15 eliminates the need for some questions.

16 HEARING OFFICER ANTONIOLLI: Okay.
17 And you can consolidate your questioning into
18 one.

19 MR. HARSCH: We'd be more than happy
20 to and after -- let them -- I would think it
21 might make more sense if we let them present
22 their additional detailed testimony since
23 they're hard at it and see what questions the
24 Board might have and what questions the

1 Agency might have and then we'll proceed with
2 our questioning.

3 HEARING OFFICER ANTONIOLLI: Okay. We
4 can -- if there's no objections, we can do it
5 that way, continue with WRT Environmental's
6 witnesses, summaries of their testimony, and
7 then go back to questioning by Mr. Harsch and
8 the Agency and then members of the public who
9 wish to comment.

10 Please note that any questions posed
11 by Board members and staff are designed to
12 help develop the complete record for the
13 Board's decision and do not reflect any bias.
14 And after the presentation by the witnesses
15 and questioning, anyone else can testify
16 regarding the proposal. Like all witnesses,
17 those who wish to testify will be sworn in
18 and may be asked questions about their
19 testimony. We'll conclude today's hearing
20 with a few procedural items. Member Johnson,
21 before we begin, would you like to add
22 anything?

23 MEMBER JOHNSON: Just briefly. I want
24 to welcome you all here and thank you for

1 coming. I also want you all to understand
2 that the Board recognizes how important this
3 rulemaking is and we're going to give it the
4 attention it deserves in order to develop a
5 clear and complete record. Thanks.

6 HEARING OFFICER ANTONIOLLI: For the
7 court reporter who is transcribing today's
8 proceeding please speak up and don't talk
9 over one another so that we produce a clear
10 transcript.

11 With that, are there any questions
12 about the procedures that we follow today?

13 (No response.)

14 I'd now ask that the court reporter
15 swear in WRT Environmental's witnesses for
16 the day.

17 THE COURT REPORTER: Raise your right
18 hands, please. Do you solemnly swear that
19 the testimony that you are about to give is
20 the truth, the whole truth and nothing but
21 the truth?

22 DR. ADAMS: I do.

23 DR. ANDERSON: I do.

24 MR. WILLIAMS: I do.

1 HEARING OFFICER ANTONIOLLI: Okay.

2 And as you testify, please introduce
3 yourselves and let us know your position and
4 title.

5 MR. FORT: Madam Hearing Officer, we'd
6 like to start with Dr. Anderson. We have
7 pre-filed testimony from Dr. Anderson. We
8 realize that -- as we were looking over
9 things that there are two charts that he
10 refers to in his testimony that did not get
11 appended to what was filed so I've got -- I'd
12 like to mark his testimony, if I may, as the
13 next exhibit, and I have some extra copies if
14 anybody wants to have the extra charts. It's
15 identical except for a typo or two, but ...

16 HEARING OFFICER ANTONIOLLI: Now these
17 charts are in addition to the charts that are
18 in?

19 MR. FORT: They are duplicative of two
20 of the charts but there should have been two
21 more charts. So if you have this document,
22 you will have all four, yeah. They're
23 labeled so I think you can pick out what's
24 additional.

1 HEARING OFFICER ANTONIOLLI: Okay.

2 MS. WILLIAMS: Do you mind if we just
3 clarify for the record?

4 MR. FORT: Yes.

5 MS. WILLIAMS: I'm assuming that when
6 you say the testimony is identical to what
7 was filed, that you mean identical except for
8 the references to --

9 MR. FORT: That's right. Thank you
10 for --

11 MS. WILLIAMS: -- the third witness?

12 MR. FORT: Dr. Anderson is here so
13 that Dr. Anderson is going to be presenting
14 the testimony. We weren't sure we were going
15 to be able to get him back for this hearing
16 and that's why Ms. Tin was also here who
17 collaborated part of the pre-filed testimony,
18 but it will just be Dr. Anderson today.

19 HEARING OFFICER ANTONIOLLI: Okay.
20 And you're entering this into -- as an
21 exhibit now?

22 MR. FORT: Yes.

23 HEARING OFFICER ANTONIOLLI: Would you
24 like to enter that along with the pre-filed

1 testimony?

2 MR. FORT: Sure, that's fine.

3 HEARING OFFICER ANTONIOLLI: Okay. So
4 we are at Exhibit No. 13 now?

5 MR. FORT: Right. I don't know if you
6 need the pre-filed testimony if you're
7 marking this because the substance is
8 identical except it has two additional charts
9 and it does not have a reference to Ms. Tin.

10 I'm happy to mark them both if
11 that's easier for you, I'm trying not to have
12 too many things that look almost the same.

13 HEARING OFFICER ANTONIOLLI: Are there
14 any objections to entering this testimony of
15 Dr. Brian Anderson with the two additional
16 charts in?

17 MS. WILLIAMS: It just doesn't look
18 identical to me and I'm not arguing with the
19 substance it's just I have reviewed it on a
20 page -- you know, based on the page numbers
21 or what have you on the original it looks
22 like -- I mean I'm just looking at the
23 paragraphs, they don't start the same. None
24 of the paragraphs seem to start out the same

1 just in skimming it.

2 Could you just clarify, is it just
3 that what's been --

4 MR. FORT: We removed the reference to
5 Ms. Tin. We removed the reference that one
6 of the two of them would be presenting
7 depending upon schedules. We made it first
8 person "I" instead of Dr. Anderson. There
9 are a couple of references that did get
10 corrected.

11 MS. WILLIAMS: Right. Okay.

12 MR. FORT: And we added two of the
13 charts at the back.

14 MS. WILLIAMS: Okay. That seems fine.

15 HEARING OFFICER ANTONIOLLI: So what
16 we do is we have this as your pre-filed
17 testimony and this is actually what we're
18 entering in as Exhibit No. 13 for today.

19 MR. FORT: That would be great, thank
20 you.

21 HEARING OFFICER ANTONIOLLI: If there
22 are no objections, I'll go ahead and enter
23 this as Exhibit 13 and seeing none, you can
24 go ahead with your testimony.

1 ORAL TESTIMONY

2 BY DR. ANDERSON

3 Thank you. My name is

4 Dr. Brian D. Anderson, I am currently the
5 Chairman of the Department of Biology and
6 Physical Sciences at Lincoln Land Community
7 College in Springfield, Illinois. I was
8 formerly the Director of the Office of
9 Resource Conservation of the Illinois
10 Department of Natural Resources, the Director
11 of the Office of Scientific Research and
12 Analysis of the Illinois Department of
13 Natural Resources, the Conservation 2000
14 Coordinator for the Illinois Department of
15 Natural Resources, Director of the Illinois
16 Nature Preserves Commission, and Natural
17 Heritage Database Coordinator for the
18 Kentucky Nature Preserves Commission.

19 I hold a Ph.D. in Biology from the
20 University of Louisville, and a master's
21 degree in Zoology from DePaul University, and
22 a bachelor's degree in Biology from Kalamazoo
23 College.

24 This testimony will comment upon

1 the Illinois Environmental Protection
2 Agency's report that, and I quote, Illinois
3 EPA conducted a literature search for radium
4 impacts to aquatic life and found no papers
5 or other information on this subject (Mosher,
6 2004), end of quotes. It will also submit --
7 it will also submit information that is
8 contrary to the testimony of IEPA, hereafter
9 Agency, staff that there is -- quote, there
10 is no data for radium to indicate what the
11 threshold concentration would be to protect
12 aquatic life and contradicts the conclusion
13 that elimination of the general water quality
14 standard for radium is justified because,
15 quote, the Agency's proposal to remove the
16 General Use and Lake Michigan standards and
17 establish a Public and Food Processing Water
18 Supply standard at the federal MCL for
19 radium 226 and 228 is protective of all uses
20 that may be impacted by radium. Also Mosher,
21 2004. End of quote.

22 In the first matter, I conducted a
23 literature search using abstract services
24 available via the Internet to any resident of

1 the Lincoln Land Community College District,
2 all or parts of nine counties surrounding and
3 including Sangamon County. I searched the
4 FirstSearch and EBSCOhost abstracts,
5 searching only for the keyword "radium" in
6 the title of the journal. Five hundred and
7 fifty-three citations were returned, which
8 met the search parameters. Of these, 37
9 dealt with the release to, transport within,
10 or impacts upon, ecological systems. Of
11 those, 12 specifically reference the uptake
12 of radium by non-human organisms in their
13 titles.

14 I supplemented this information
15 with Internet searches using search
16 parameters including the word "radium" which
17 returned results which included fact sheets
18 and toxicity profiles from several of the
19 Agency's sister state and federal agencies.
20 It would appear that the Agency's literature
21 search was overly narrow and totally ignored
22 the literature on the biological effects of
23 radiation generally from radioisotopes.
24 Since biological damage is caused by the

1 radiation, rather than the chemical activity
2 at the molecular level, all such information
3 is relevant to an assessment of the effects
4 of radium on biota.

5 Contrary to the Agency's testimony
6 before the Board, the available scientific
7 information that was found establishes that:

8 First, radium produces alpha, beta
9 and gamma radiation like all other
10 radioisotopes. There are over 40 -- there
11 are 40 radioisotopes like radium which are
12 known to occur naturally.

13 There is 50 years of data
14 identifying the various negative impacts of
15 radiation upon a broad spectrum of animals
16 and plants.

17 Also, it isn't necessary to do
18 species specific studies on whether radium
19 can harm a particular species inhabiting in
20 Illinois. All radiation can have harmful
21 effects upon living cells.

22 Also, risk increases directly with
23 increases in exposure to radiation, no matter
24 the source.

1 Further, no increase in radiation
2 above background levels is without risk. In
3 other words, there is no "safe" level, only
4 levels with minimal increases in risk,
5 according to the Illinois Department of
6 Public Health, 2004.

7 Radium is also a known carcinogen,
8 Illinois Department of Public Health, 2004.
9 It is bioaccumulative and bioconcentrating
10 according to the Agency for Toxic Substances
11 and Disease Registry, 1990.

12 Radium is also closely related
13 chemically to calcium, it moves easily
14 through the environment and it can become
15 very concentrated in calcium-rich tissues
16 like bones and mollusk shells.

17 Radium also concentrates in
18 sediments and sewage sludge, potentially
19 creating hot spots in the stream sediments
20 below discharges and contaminating sewage
21 treatment facilities.

22 In Florida, according to a
23 Technical Report to the Southwest Florida
24 Water Management District, 2000, in lakes

1 that are recharged with groundwater
2 containing low levels of radium 226, levels
3 less than five picoCuries per liter, it was
4 found that the sediments, which contain 20.4
5 picoCuries per gram of radium 226, are over
6 3.5 times the EPA cleanup standard of five
7 picoCuries per gram over background.
8 Typically the increase of radium in the
9 sediments is ten times over background.

10 They also found that freshwater
11 mussel flesh contained as much as 200
12 picoCuries per gram radium 226. A level that
13 would require the flesh of those mussels to
14 be sent to a low level radioactive waste
15 site.

16 It was also found that elevated
17 levels of radium have been found in fish bone
18 and fish flesh.

19 The concentration of radium in
20 newly deposited sediment is increasing
21 dramatically as new sediments are being
22 deposited. And please refer to the charts
23 that we just discussed earlier done by the
24 University of Florida in 2004.

1 At Elliot Lake, Canada, in a lake
2 that has only two picoCuries per liter radium
3 226 below a Uranium Mine, elevated radium has
4 been found in cattails and in the muskrats
5 that eat the cattails. Clulow, 1996.

6 Clearly it has been shown that the
7 biological mechanisms and pathways of
8 exposure exist to allow radium to present a
9 risk to aquatic life if discharged at
10 concentrated levels into the environment. It
11 is particularly problematic when
12 bioaccumulation of radium in mussels occurs.
13 The Illinois mussel fauna is already under
14 severe pressure with 27 species of mussels
15 listed as endangered or threatened species in
16 the state, Endangered Species Protection
17 Board, 1999.

18 The Illinois Department of Natural
19 Resources possesses site specific information
20 for all known occurrences of listed species
21 and the IEPA has a statutory obligation under
22 the Illinois Endangered Species Protection
23 Act to consult with IDNR on potential impacts
24 to listed species associated with any

1 proposed action. Further, predation on
2 mussels by fish, waterfowl, otters, raccoons,
3 and muskrats is well documented. Some
4 species like raccoon, common red horses, and
5 many species of diving ducks, including
6 commercially valuable, hunted species like
7 the ring-necked duck or, quote, bluebill,
8 selectively feed on mussels and could both be
9 in danger of receiving concentrated exposures
10 and subsequently, serving as pathways to
11 other predators and scavengers, like bald
12 eagles or other raptors.

13 On another front, the land application
14 of waste treatment sludge that exhibits high
15 concentrations of radium opens up the
16 possibility of many terrestrial pathways for
17 exposure, including bioaccumulation in
18 indigenous vegetation or in planted crops, or
19 uptake by birds, snakes, turtles, or shrews
20 when they eat earthworms.

21 With regard to the levels of
22 radium that would pose a threat to aquatic
23 life, considerable scientific consideration
24 has also been given this question. The U.S.

1 Department of Energy, Biota-Dose Assessment
2 Committee has developed a standardized
3 methodology that calculates that radium
4 levels over 3.75 picoCuries per liter in
5 water of combined radium 226 and radium 228
6 is above the threshold to protect aquatic and
7 riparian wildlife populations, from the
8 Biota-Dose Advisory Committee, 2000. This is
9 in DOE Standard 1153-2002, it's called A
10 Graded Approach for Evaluating Radiation
11 Doses to Aquatic and Terrestrial Biota. It
12 was specifically developed to identify
13 threshold levels for specific radioisotopes
14 below which impacts to biota have not been
15 observed.

16 In conclusion, contrary to earlier
17 IEPA testimony, this scientific literature
18 clearly documents the risk that radium
19 presents to aquatic biota. We, therefore,
20 recommend that the current general standard
21 for radium 226 of one picoCurie per liter
22 remain in place (recognizing, of course, that
23 there is a concomitant contribution of
24 radiation from radium 228), until such

1 time -- they should be left in place until
2 such time that the Agency familiarizes
3 themselves with the environmental risks posed
4 by radium and DOE Standard 1153-2002, and
5 formulates a more defensible proposal. In my
6 opinion, if there is an affordable technology
7 available that avoids the need to reintroduce
8 radium to the environment, it should be
9 employed.

10 I thank you for your attention,
11 and I'll be glad to answer any questions that
12 you may have.

13 HEARING OFFICER ANTONIOLLI: Thank
14 you, Dr. Anderson.

15 MR. FORT: Would you like us to go to
16 our next witness?

17 HEARING OFFICER ANTONIOLLI: Why don't
18 you go ahead with Dr. Adams.

19 MR. FORT: That would be fine. Let me
20 tender as an exhibit here. We realized after
21 we filed this that some of the attachments to
22 Ted Adams' testimony were in the wrong order
23 and had a couple phone calls with people
24 saying I don't follow this so my apologies;

1 that was our fault in terms of making
2 photocopies.

3 We have -- would like to have
4 entered as an exhibit, and I have extra
5 copies, of the amended attachments, it's A --
6 one of the maps in A and E were transposed
7 and Attachment B has the pages in order and I
8 think we had them numbered too so we should
9 not have the problem. My apologies again for
10 that pagination issue.

11 So if we could mark -- so what
12 I've got here, Madam Hearing Officer, to mark
13 as an exhibit is Mr. Adams' pre-filed
14 testimony with Attachments C, D -- with all
15 the attachments as filed except for A, B and
16 E which have now been put in the correct
17 pagination order.

18 HEARING OFFICER ANTONIOLLI: Would you
19 like to take -- let the Agency take a look at
20 it?

21 MR. FORT: Sure.

22 MS. WILLIAMS: We don't have any
23 objection.

24 HEARING OFFICER ANTONIOLLI: Okay. If

1 there are no objections, I'll enter this
2 pre-filed testimony of Ted Adams along with
3 the corrected exhibits as Exhibit 14.

4 MR. FORT: Thank you. Okay,
5 Mr. Adams.

6 ORAL TESTIMONY

7 BY DR. ADAMS

8 I, Theodore G. Adams, President of
9 T.G. Adams and Associates, hereby
10 respectfully submit supplemental testimony to
11 address questions raised by the Illinois
12 Pollution Control Board, here known as the
13 Board, and the Illinois Environmental
14 Protection Agency (the "IEPA" or the
15 "Agency") during the prior hearing in this
16 matter held on August the 11th, 2004.

17 I previously submitted testimony
18 to the Board. Certain areas of my prior
19 testimony were the subject of questioning,
20 and the purpose of this supplemental
21 testimony is to address any ambiguities for
22 the record.

23 The first question: What would be
24 a safe level of radium in general use waters

1 of Illinois? The existing standard of
2 one picoCurie per liter of radium 226
3 generally is recognized as a background
4 condition in surface waters of Illinois.
5 Given that radium is a recognized carcinogen,
6 and a degradation or decay product of uranium
7 and thorium, it is not surprising that the
8 Board would set such a level. By doing so,
9 any variations from that standard would
10 require careful consideration.

11 From the analyses I have
12 performed, it appears that any increase over
13 the existing standard could result in an
14 excessive radium exposure. Clearly, the
15 Biota-Dose Assessment Committee approach
16 would not allow for a general increase over
17 these background levels without a careful
18 data collection and site by site analysis and
19 justification.

20 But the effect of the Agency's
21 proposal is to eliminate any water quality
22 standard for this carcinogen from most
23 Illinois waters. Attachment A hereto is a
24 map compiled from the Agency's Exhibits 1 and

1 2; the public water supply wells with known
2 radium levels over five picoCuries per liter
3 and they are shown in red, and the downstream
4 receiving waters are shown in yellow.

5 Clearly, the effect of the proposal is to
6 wipe out any radium limits for Illinois
7 waters, even those receiving levels over
8 background.

9 The Biota-Dose Assessment
10 Committee or BDAC approach demonstrates that
11 adverse effects from radium in waters may
12 occur at levels slightly above background.
13 Using the BDAC approach, I have calculated
14 that beginning at levels in the range of 1.4
15 to 1.88 picoCuries per liter for radium 226,
16 the water quality would exceed the general
17 biota dose limit. Attachment B to my
18 supplemental testimony is a summary of the
19 approach used and the calculations I have
20 performed. These show that even if there is
21 no radium contamination in the sediment, the
22 general biota dose limits would be exceeded
23 at 1.88 picoCuries per liter of radium 226,
24 in the presence of 1.88 picoCuries per liter

1 of radium 228.

2 Using the combined radium limit
3 approach put forth by the Agency for drinking
4 water standards, the safe limit could be 3.75
5 picoCuries per liter, and I ask you to refer
6 to Attachment B, Page 2. But if the sediment
7 levels are 12.2 picoCuries per gram (as was
8 documented by the Florida studies that are
9 included in Attachment D), then the safe
10 level would fall to 1.4 picoCuries per liter
11 for each. Clearly, there's very little room
12 to relax the existing water quality standard
13 without further data and specific analysis.
14 And clearly, the expected effluent of five to
15 ten picoCuries per liter, from several of the
16 example POTWs contained in Mr. Williams'
17 testimony Table 5, would fail the BDAC
18 criteria. I refer you to Attachment B, cases
19 three through six.

20 I believe that the approach taken
21 by the BDAC merits considerable weight. The
22 Department of Energy is responsible for
23 managing and controlling, at its facilities,
24 a large portion of the country's radioactive

1 materials, subject to oversight by the EPA,
2 the Nuclear Regulatory Commission and the
3 states, and has devoted substantial resources
4 to protecting the environment from radiation.
5 The BDAC approach is based on the DOE order
6 to its contractors, which has been recognized
7 by EPA and other states, an important
8 criteria for avoiding impact to human health
9 and the environment. I refer you to
10 Attachment C. And if the Board wants to have
11 water quality standards to protect aquatic
12 life and the environment, it would appear
13 that the existing standard may be
14 appropriate.

15 Moreover, new information arising
16 out of sampling and investigations done in
17 Florida, and including data just published in
18 August of this year, would indicate that
19 radium levels in the very range that meet the
20 BDAC dose -- biota dose limit may adversely
21 affect mussels, including mussels such as
22 those listed as endangered or threatened in
23 Illinois. Attachment D hereto is a letter
24 from one of the Florida researchers who has

1 evaluated the bioconcentration in sediments
2 and mussels from the various lakes in
3 Florida. These lakes must be replenished by
4 pumping groundwater, which has radium at
5 levels I consider background; in other words,
6 one to two picoCuries per liter. The
7 recently published data shows that the
8 mussels in these lakes bioaccumulate radium
9 to levels over 200 picoCuries per gram.

10 Illinois has many endangered
11 mussels which inhabit the waters threatened
12 to be deregulated by the proposed rule.
13 Attachment E hereto are maps taken from the
14 IDNR website showing river basins where these
15 endangered species may be found. I do not
16 know if there's a relationship between the
17 background radium and these endangered
18 species, but clearly the effect of this
19 proposed rule has not been adequately
20 considered.

21 In conclusion, radium can cause
22 adverse effects on aquatic life and riparian
23 animals. It is a carcinogen to humans and it
24 bioaccumulates in mussels and up the aquatic

1 food chain. Though the current standard may
2 be virtually the same as background, I would
3 urge that a compelling case is required
4 before relaxing the general water quality
5 standard for such a material.

6 Question No. 2: Are there other
7 sources of radium discharging? The explicit
8 assumption made by the IEPA was that an
9 exceedance of the existing standard would
10 occur only as a result of the presence of
11 elevated radium in drinking water or the
12 treatment of drinking water. I would note
13 that the goal of the EPA drinking water
14 standard is zero; the five picoCuries per
15 liter reflects a risk of one in 10,000. But
16 left unaddressed in this proceeding is the
17 question, "who else could be a source?"

18 My prior testimony showed that
19 radium is a degradation or breakdown product
20 of other nuclear radioactive materials.
21 These include thorium and uranium. But there
22 is no evidence presented in this proceeding
23 of who or where those potential or actual
24 sources are, whether they be industrial,

1 commercial or municipal. It seems to me that
2 there are likely other dischargers of radium
3 that exist.

4 At least one of the participating
5 facilities in the AMSA study was a publicly
6 owned treatment works in the northeastern
7 Illinois area. This POTW is in an area that
8 has a high concentration of radium in
9 groundwater withdrawals. Because of the
10 confidentiality of the terms in the AMSA and
11 ISCORS study, I am not at liberty to divulge
12 the name of the plant. But I can testify
13 that, given the groundwater levels known to
14 exist in that locale, the sludge levels
15 reported for that POTW are consistent with
16 the predicted sludge levels and worker
17 exposure levels presented in my prior
18 testimony.

19 This observation led me to seek
20 additional information about other documented
21 dischargers of radium. However, time did not
22 permit a review of radium dischargers in
23 Illinois, but we did find that at least one
24 nuclear plant reported radium discharge

1 levels exceeding the current standard. For
2 the LaSalle plant, radium 226 was reported
3 for two outfalls at 2.6 picoCuries per liter,
4 and total radium values were 4.1 and 9.0
5 picoCuries per liter. In a couple of
6 instances it appeared that the amount of
7 radium increased across specific wastewater
8 processes. I refer you to Attachment I.

9 The record in this proceeding does
10 not identify other sources beside municipal
11 drinking water treatment plants might be the
12 beneficiary of this deregulation. There may
13 be others. Indeed, even among the group that
14 was identified as needing regulatory
15 relief -- communities that need to treat
16 their groundwater supply to meet the new
17 drinking water standard -- some already have
18 decided that they do not need to flush their
19 treatment water filtrate down the sewer and
20 still can save hundreds of thousands of
21 dollars.

22 Question No. 3 asked: Are there
23 other impacts on publicly owned treatment
24 works beyond those in Agency Exhibit 11? The

1 IEPA suggests in its Exhibit 11 that the
2 POTWs will benefit by avoiding certain costs
3 if this proposed rule were adopted. But
4 there are other costs that will result from
5 the adoption of the proposed rule. The
6 overall costs appear actually to be much
7 greater when one considers all the
8 implications of the Agency's proposal.

9 The IEPA has not provided this
10 proceeding with evidence concerning testing
11 or monitoring of sewage sludge levels for
12 radium. Yet, the economic and operational
13 impacts of radiologically contaminated
14 influent/sludge on POTWs are well documented.
15 For example, in Cleveland, Ohio, Advanced
16 Medical Systems, an NRC licensee, discharged
17 minute amounts of non-soluble radioactive
18 particles of Cobalt 60 over a period of 20
19 years into the sewer system. These minute
20 radioactive particles contaminated the POTW
21 and the resulting sludge. And the aggregate
22 radioactivity disposed of into the sewer
23 system over the 20-year period was less than
24 a half of Curie. I refer you to Attachment

1 F.

2 But nevertheless, the NEORS
3 incurred more than \$2 million in cleanup
4 costs when these elevated radiation levels
5 were discovered by chance. An enormous
6 amount of radioactive contaminated material
7 which occurred as a result of a miniscule
8 amount of radioactivity is still present at
9 the Northeast Ohio Region District. Cobalt
10 60 has a half-life of approximately five to
11 six years, and Cobalt 60 does not produce
12 radon as a by-product. In contrast, radium
13 226 has a half-life of approximately
14 1600 years, and does produce radon as a
15 by-product.

16 In comparison, a moderately-sized
17 city with elevated radium levels may exceed
18 this quantity in its sludge. I've completed
19 a review of the IEPA calculation for the
20 amount of radium contamination found in sewer
21 sludge from the City of Joliet's sewer system
22 for a period of one year. The amount of
23 radium contamination found in Joliet's sewer
24 sludge over the course of just a single year

1 was .293 Curie. Refer you to Attachment G,
2 Page 12 of the Agency's Exhibit 12. The
3 amount of radium contamination found in
4 Joliet's sewer sludge over a period of one
5 year was more than half the amount of
6 radioactive contamination for a 20-year
7 period found in the sewer system in
8 Cleveland, Ohio. And thus, over a similar
9 20-year period, the Joliet POTWs would appear
10 to generate more than ten times the quantity
11 of radiation that caused substantial injury
12 to the sewer system in Cleveland, Ohio. And
13 the radium 226 will take longer to decay or
14 degrade than the Cobalt.

15 On the other hand, if the
16 radium-laden residuals, i.e., Technically
17 Enhanced Naturally Occurring Radioactive
18 Material commonly known as TENORM,
19 T-E-N-O-R-M, are disposed of into the sewer,
20 then the public water systems, the POTWs, and
21 the state of Illinois can expect to have the
22 following increased costs: One, the
23 uncontrolled discharge of radium residuals
24 would or could be a liability issue to

1 municipalities and POTWs (as cited in
2 Cleveland, Ohio); two, POTW workers will
3 require training, personnel exposure
4 monitoring and medical monitoring as
5 occupational radiation workers; three, sewer
6 sludge and handling areas will require
7 ongoing testing; four, the POTW may be
8 required to obtain a radioactive materials
9 license; five, application of sewer sludge to
10 farmland will require ongoing monitoring; and
11 last, sewer pipes and lines and the POTW
12 itself (or parts thereof) may require
13 decontamination. These costs are the
14 practical result of the Agency's proposal.

15 And there's another environmental
16 cost to the proposal. The Agency expects the
17 water treatment plants will flush filtrate
18 materials down the sewer. This activity
19 requires the pumping of additional
20 groundwater to carry out the backflushing
21 operation. The amount of groundwater may be
22 on the order of five to 25 percent of the
23 quantity of water being pumped for human
24 consumption. Areas already relying on deep

1 aquifers for portable water supply are in the
2 same areas where the groundwater resource is
3 being depleted. As an example, although
4 Joliet was already extracting the largest
5 quantity of well water from deep aquifers in
6 1995, there continues to be a further
7 drawdown in the groundwater level by over 25
8 feet. This is among the largest drawdowns
9 since 1995 in the northeastern Illinois area.
10 And I refer you to a quote of the Comparison
11 of Potentiometric Surfaces for the
12 Cambrian-Ordovician Aquifers of Northeastern
13 Illinois, 1995 and 2000, Table 2, Figure 9
14 attached hereto as Attachment H.

15 For Joliet, backflushing would
16 therefore increase the groundwater drawdown
17 by .5 to 2 and a half million gallons per
18 day. And, moreover, Kane County shows the
19 largest growth in deep well pumping of any
20 county in the area. See Table 1. And this
21 is not surprising in light of its growth. At
22 the same time, Kane County communities have
23 some of the highest radium levels in
24 groundwater. And thus, the amount of water

1 containing elevated levels of radium being
2 extracted from the deep aquifers seems likely
3 to continue to increase. Allowing the use of
4 backflushing in these areas would only
5 increase the demand on the deep aquifer
6 resources. And the discharge to surface
7 waters will carry increased amounts of
8 radium.

9 In conclusion, the existing
10 standard represents background conditions.
11 And interestingly, the BDAC approach,
12 required of all DOE facilities, would require
13 site specific data and further analysis on
14 any water quality condition over this general
15 background level. There's clearly no basis
16 to remove radium as a general aquatic quality
17 criterion without more data.

18 Removing the radium standard,
19 without first imposing a control on storm and
20 sewer discharges of radium comparable to
21 those required of facilities regulated by the
22 IEMA allows TENORM, T-E-N-O-R-M, radium to be
23 backwashed down sewers. This not only
24 reintroduces a carcinogen back into the

1 environment, it potentially exposes POTW
2 workers to radium levels above that allowed
3 even for workers in a nuclear power plant and
4 it results in radium being applied to crop
5 soils as part of the municipal sludge. From
6 an environmental viewpoint, all radium
7 TENORM, especially radioactive solids, should
8 not be permitted down sewers, regardless if
9 one is a licensee of IEMA or not. Thank you.

10 HEARING OFFICER ANTONIOLLI: Thank
11 you, Mr. Adams. At this point we'll return
12 to Mr. Harsch, return to his questions.

13 MR. HARSCH: I believe that -- I think
14 it might be more appropriate if the Agency
15 has the proponent to proceed.

16 HEARING OFFICER ANTONIOLLI: Are you
17 ready to proceed at this point?

18 MS. WILLIAMS: I can. I mean my only
19 issue is I have quite a few questions again
20 on the new stuff so I did sort of monopolize
21 the last hearing so I want to make sure
22 that --

23 MR. HARSCH: We have two days.

24 MS. WILLIAMS: -- the Board and

1 everybody else gets a chance, but I'm ready
2 to go any time, so whenever you want.

3 HEARING OFFICER ANTONIOLLI: That's
4 understandable, but you can go ahead and ask
5 questions.

6 MS. WILLIAMS: Okay. I'm going to
7 come around if that's okay so I can see.

8 HEARING OFFICER ANTONIOLLI: Also let
9 me know if any of your witnesses need to be
10 sworn in.

11 MS. WILLIAMS: Okay. Yeah, I guess
12 just for the record maybe I can introduce the
13 folks that I brought with me today. I'm
14 Deborah Williams, assistant counsel of the
15 Illinois EPA, and with me also I have
16 Stefanie Diers also assistant counsel in our
17 legal department. Maybe the technical staff
18 can introduce themselves and what they do.

19 MR. MOSHER: Okay. I'm Bob Mosher,
20 and I'm the manager of the Water Quality
21 Standards Unit.

22 MR. KUHN: I'm Jerry Kuhn, I'm manager
23 of the Permit Section of the Division of
24 Public Water Supplies.

1 MR. KINSLEY: Blaine Kinsley, acting
2 manager of the Industrial Unit, Permit
3 Section, Bureau of Water.

4 MR. HUTTON: Jeff Hutton, I'm an
5 environmental protection specialist, and I
6 deal with the sludge application program.

7 MS. WILLIAMS: And I don't see any
8 reason to swear in our folks at this time.
9 I'm assuming at some point the Board might
10 want to ask some more questions and we can do
11 it then.

12 HEARING OFFICER ANTONIOLLI: We can do
13 that at that time.

14 MS. WILLIAMS: Good afternoon. I
15 guess I'll start with Dr. Anderson first.
16 Thanks for joining us today. I'm going to
17 apologize a little bit ahead of time, I kind
18 of -- Mr. Adams knows last time I sort of
19 went through the testimony and organized my
20 questions by going page by page through the
21 testimony so my page numbers might be a
22 little off, it might take me a second to
23 adjust to the new version.

24 MR. FORT: Excuse me. If you have the

1 other version, he can refer from that.

2 MS. WILLIAMS: Is that okay?

3 MR. FORT: That's fine, yeah. He'll
4 find it.

5 WHEREUPON:

6 DR. BRIAN D. ANDERSON,
7 called as a witness herein, having been previously
8 duly sworn, deposes and saith as follows:

9 D I R E C T E X A M I N A T I O N

10 By Ms. Williams

11 Q. Okay. Why don't we start out,
12 Dr. Anderson, could you tell us a little bit about
13 your prior experience before this matter dealing
14 with radium or other radiological elements?

15 A. Well, general training, physical
16 chemistry, those kinds of things in the university.
17 The last several weeks I have intensively studied
18 the issue, conferred with chemists, conferred with
19 other radiologic experts, reviewed the literature so
20 I've done --

21 Q. But prior to this case that wasn't a
22 particular function of your work at the Department
23 of Natural Resources in the past really?

24 A. No, not necessarily except that in my

1 capacity as director of the office of scientific
2 research and analysis, I did oversee the state water
3 survey and the issue of radium in drinking water of
4 course has been an ongoing concern there for 25,
5 30 years or so.

6 Q. Right, the drinking water.

7 A. In that capacity, there was a lot of
8 discussion about radium in the drinking water.

9 Q. And have you participated in, I'm
10 assuming, in water quality standards rulemaking
11 before the Board in the past?

12 A. Yes, I have. I was involved in the
13 arsenic rulemaking. In the capacity that I served
14 at with the Department of Natural Resources there
15 have been occasions when the Agency did, in fact,
16 consult with DNR on rulemaking and because of my
17 capacity as more or less chief scientist there, I
18 was involved with discussions with the division of
19 resource review in coordination with some primary
20 point of contact with the IEPA.

21 Q. And in the arsenic rule that you talk
22 about, was that a drinking water rulemaking or a
23 water quality standard rulemaking?

24 A. I don't recall actually. I'd have to

1 review the paperwork.

2 Q. If I were to tell you that I believe
3 it was the drinking water rulemaking, would you
4 think --

5 A. No, I would not contradict that.

6 Q. Then are you familiar with the
7 national guidelines for deriving water quality
8 standards published by USEPA I think in 1986?

9 A. Well, in the context of general
10 discussions about Clean Water Act and my
11 understanding was that the concept was that the
12 national standards were established and that state
13 standards were only to be modified in the presence
14 of existing data and then usually only to establish
15 a stricter standard than the national standards but
16 that appears not to have been a procedure we were
17 generally following in this case.

18 Q. Excuse me? You said it's not the
19 procedure we're following in this case?

20 A. Well, given that the Agency is
21 testifying in the absence of information on impacts
22 of radium on aquatic biota, that we should eliminate
23 the standard that would seem contrary to that
24 general concept.

1 Q. Are you aware of whether there is one
2 of those federal criteria for rating?

3 A. There is not.

4 Q. And are you familiar with the kind of
5 studies that USEPA guidance requires the states to
6 look at when developing water quality standards?

7 A. Well, I need to be educated.

8 Q. Okay. Well, we'll do that for you
9 later if you want to hang around. Let's talk a
10 little bit about you describe in your testimony the
11 Internet research that you did --

12 A. Uh-hum.

13 Q. -- and can you just describe I guess
14 for me about how long it took?

15 A. Oh, couple of days.

16 Q. And did you review -- I think you said
17 you came up with like 500 and some hits, correct?

18 A. True.

19 Q. And then of those, about 12 looked at
20 uptake and --

21 A. Uptake and organisms.

22 Q. -- organisms? Did you review those 12
23 studies?

24 A. Well, with these search engines, some

1 of -- some of those articles are abstracts so you
2 have abstracts of the content. Some of them in the
3 title it's obvious so I only looked at things that
4 are specifically referenced in the testimony frankly
5 because there were only two weeks to prepare
6 material to present.

7 Q. So you didn't -- so just to be clear,
8 you didn't look at those 12 studies that you're
9 saying are relevant to this particular case?

10 A. Not all of them. The ones that are
11 referenced are here.

12 Q. There are two studies in particular
13 that I believe are referenced in your testimony.
14 Were those two studies -- did you get them as hits
15 on your -- is that where you found them, were they
16 hits on your --

17 A. Which ones?

18 Q. -- in your Internet research? I
19 believe there's a study from Florida that you
20 discussed in some detail and then I got --

21 A. No, actually I was made aware of
22 that --

23 Q. By whom?

24 A. -- in discussions with WRT.

1 Q. Okay.

2 A. And I think they actually shared that
3 with -- in their testimony with the Agency.

4 Q. So you would not be testifying today
5 that you found that study in your Internet search?

6 A. No. I actually found it on the
7 website as PCB and is part of the record.

8 Q. Thank you. So you couldn't tell us
9 today that any of the articles that are out there on
10 the Internet would tell the Agency or the Board what
11 the proper water quality standard for radium should
12 be?

13 A. I would not presume to. I mean,
14 that's a jurisdiction of the Board and the Agency.
15 Are you, in fact, asking whether there is a
16 threshold that has consensus within the scientific
17 community for protection of aquatic life?

18 Q. I'm actually not asking that question.

19 A. Am I hearing you right?

20 Q. But I will ask that question.

21 A. Good.

22 Q. And I think I'll ask that question,
23 I'd like to phrase it maybe a little differently.
24 On what I have as -- let's see. Okay. On Page 4, I

1 believe it's about -- of the original testimony, I'm
2 not sure, it will be the last page probably still of
3 the new version.

4 A. Okay.

5 Q. There is a paragraph, I guess it's
6 three from the bottom if you count the last sentence
7 where that word threshold comes up.

8 A. Beginning with regard to the levels?

9 Q. Beginning with regard to the levels.
10 I'd like to talk about the second sentence.

11 A. Okay.

12 Q. And I'll just repeat it --

13 A. Okay.

14 Q. -- for the rest of us to be focused.
15 It says, the U.S. Department of Energy Biota Dose
16 Advisory Committee has developed a standardized
17 methodology that calculates that radium levels over
18 3.75 picoCuries per liter in water of combined
19 radium 226 and 228 is above the threshold to protect
20 aquatic and riparian wildlife populations.

21 I'd like to ask you a couple
22 questions about that. I guess the first question I
23 have is did you find this figure 3.75 picoCuries per
24 liter in that document?

1 A. No. It provides the formula and it
2 also provides what they call the BCGs, they are
3 factors that can be used to differentiate between
4 the relative power of a radioactive decay for
5 different isotopes so they have a table with all the
6 radioactive isotopes, they provide the formula and
7 you plug in --

8 Q. And does it just have one table or
9 does it have multiple tables?

10 MR. FORT: Excuse me, can he finish
11 his answer?

12 BY THE WITNESS:

13 A. I mean, it's actually presented in
14 several places, the formula. So you take --
15 basically it's the picoCuries of all the
16 radioisotopes over the conversion factors added
17 together.

18 Now I've presented this in the
19 context of radium 226 and 228. This standard is
20 actually a standard which is for all radiation. So
21 the assumption here in calculating it's 3.75
22 picoCuries for all radiation but it's protective of
23 aquatic and riparian life.

24

1 BY MS. WILLIAMS:

2 Q. Really?

3 A. Yes.

4 Q. So it would be 3.75 for uranium or
5 other --

6 A. No.

7 Q. Okay.

8 A. No, and this is something that --
9 there seems to be a confusion throughout the entire
10 record. Radiation is the agent that causes
11 biological damage. Radium is not the only potential
12 source of radiation, there is uranium in water in
13 many cases in Illinois. There may be other sources
14 of -- and in this case radium is primarily an alpha
15 emitter.

16 So in order that the standard that
17 is protective is 3.75 picoCuries of radiation, no
18 matter what the source is. And you have to add all
19 the sources together to determine if it goes over
20 that threshold.

21 Q. Let's talk about what you mean by
22 threshold. The second part of this sentence you say
23 is above the threshold to protect aquatic and
24 riparian life populations. The first question I

1 have is isn't it true that this calculation, using
2 the DOE screening tool, was done -- well, first of
3 all, was it done by you or done by Mr. Adams?

4 A. I may have seen his calculations in
5 the testimony. Again, I reviewed the entire record
6 that was on the website so I'm sure that I've seen
7 it there, but I re-read the entire Graded Approach
8 for Evaluating Radiation Doses to Aquatic and
9 Terrestrial Biota.

10 HEARING OFFICER ANTONIOLLI: If I can
11 interrupt you there. We have several
12 references in the pre-filed testimony and
13 today to this document that you're referring
14 to. We have in the pre-filed testimony
15 Module 1 entered, and I think that the
16 equation you're also referring to is found in
17 another section of that document.

18 MR. FORT: It's possible.

19 HEARING OFFICER ANTONIOLLI: And so if
20 there's no objection, I'd like to enter into
21 the record the entire document.

22 MR. FORT: Fine.

23 HEARING OFFICER ANTONIOLLI: So we all
24 have -- I have an extra copy or two if anyone

1 needs to take a look at it, but I think that
2 all of us that have been involved have taken
3 a look at the document already and have you
4 had a chance to look at it yet?

5 MS. WILLIAMS: I have all of Module 1
6 which -- I believe they did provide all of
7 Module 1, but I wouldn't say that I have the
8 whole thing. I believe it's available on the
9 Internet.

10 HEARING OFFICER ANTONIOLLI: It is and
11 we have a copy here for you too if you'd like
12 to take a look but it includes where he found
13 the equation which --

14 MR. HARSCH: Does that include the
15 preliminary module as well?

16 HEARING OFFICER ANTONIOLLI: Yes.

17 MR. HARSCH: I guess sort of a
18 foreword to the document?

19 HEARING OFFICER ANTONIOLLI: Yes.
20 It's the entire thing and you can take a look
21 at it here too, but...

22 MS. WILLIAMS: I certainly have no
23 objections to entering that document.

24 HEARING OFFICER ANTONIOLLI: If

1 there's no objection, I'll go ahead and enter
2 that as --

3 MR. HARSCH: I would like to look at
4 it first.

5 HEARING OFFICER ANTONIOLLI: Yes.

6 MEMBER JOHNSON: Give you maybe
7 40 seconds to read that.

8 MR. FORT: Can I make a suggestion on
9 this? Maybe if we -- if the question is is
10 that the complete document or not --

11 MR. HARSCH: We have no objection.

12 MR. FORT: -- 14, whatever the
13 complete document is, will be I think it's
14 15.

15 HEARING OFFICER ANTONIOLLI: Exhibit
16 15. Okay. Now you can go ahead.

17 BY MS. WILLIAMS:

18 Q. Okay. The first question I want to
19 get back to is isn't it true that the calculation
20 used was focused on riparian mammals, correct?

21 A. The limiting organisms are riparian
22 mammals.

23 Q. But had they looked at aquatic life or
24 humans, we would have gotten a different answer?

1 A. Well, no.

2 Q. Or aquatic life or plants let's say.

3 A. The threshold for aquatic life,
4 fishes, you know, things that are in the water all
5 the time, is one rad per day. The limiting factors
6 actually on riparian organisms, higher organisms,
7 mammals primarily, and that's .1 rads per day.

8 Q. And .1 rads per day, what was used?

9 A. We used the basis for the calculation
10 that derives the 3.75 picoCuries per liter.

11 Q. You keep using this word threshold.
12 Can you tell us what this tool, which I'm going to
13 call screening tool, I believe that's what the
14 document calls itself, what the screening tool is
15 intended to be used for?

16 A. Well, I'm not sure. I'm not sure. I
17 thought I heard two questions, could you read that
18 back?

19 (Whereupon, the requested
20 portion of the record
21 was read accordingly.)

22 BY THE WITNESS:

23 A. Okay. As described by BDAC in this
24 document, the threshold, that figure, is the level

1 of radiation exposure below which no population
2 level effects on the biota has been documented.

3 BY MS. WILLIAMS:

4 Q. Isn't it --

5 A. That's what it is.

6 Q. Isn't it true, Dr. Anderson, that this
7 tool was designed for the Department of Energy to
8 look at sites to evaluate whether additional study
9 was needed or not. To say if you're below this, no
10 additional study is needed; if you're above this,
11 well, maybe we should take a look and see what's
12 going on?

13 A. If it's above this, there may be
14 potential biotic impact and we should take a look.
15 It's almost identical to Ectox which the Agency is a
16 proponent of. In fact, the graded approach and the
17 tier approach are virtually the same process.

18 Q. And those are both used primarily in
19 the cleanup process, right, where something has
20 already been polluted by --

21 MR. FORT: Objection. You know, if
22 you've got the document, instead of you
23 trying to characterize the document, let's
24 let the document be used as opposed to a

1 general, you know, lawyer's gloss on it.
2 Because I don't think the document, if you
3 read it, it will not be as limiting as you're
4 trying to make it out to be.

5 HEARING OFFICER ANTONIOLLI: Well, she
6 can go ahead and ask questions as long as
7 it's --

8 MS. WILLIAMS: I don't agree.

9 BY MS. WILLIAMS:

10 Q. Did you consult the author of the
11 document as part of your research?

12 A. It was multiple authors.

13 Q. Did you consult any of the authors as
14 part --

15 A. It's an available public document.

16 Q. You read it, you did in part?

17 A. Yeah, it's monstrous.

18 Q. Are there any studies that you were
19 aware of that document a no effect level for radium?

20 A. That's what this number does.

21 Q. This is based on an observed --

22 A. No population level effects. That
23 means that even at these levels, there could be
24 effects to individuals like threatened endangered

1 species.

2 Q. Is this model based on any papers and
3 studies that document no effects?

4 A. It's not a model. What do you mean by
5 model?

6 Q. Are there any controlled observational
7 experiments that were the basis for this study?

8 A. That do what? I mean, yeah. I mean,
9 there's a huge literature on the impacts of
10 radiation on biota, these guys are the experts in
11 the world.

12 Q. That's your testimony?

13 A. Pardon?

14 Q. Your testimony there's -- Go ahead,
15 repeat it. There's a huge ...

16 A. There is a huge body of literature --

17 Q. Yes.

18 A. -- on the impacts of radiation on
19 biological species whether --

20 Q. Controlled experiments?

21 THE COURT REPORTER: I'm sorry?

22 BY MS. WILLIAMS:

23 Q. Are there controlled experiments?

24 A. Absolutely. In fact, there's a

1 wonderful reference done by a guy in Patuxent, it's
2 a synoptic guide to the impacts of radiation on
3 wildlife, fish and in birds, 147 pages. Lists all
4 the species that have been tested, the various
5 isotopes that were used as the sources and the
6 effects, huge body. This is one of the most
7 intensively studied phenomenon in science, the
8 impacts of radiation on organisms.

9 MS. WILLIAMS: I'd like to go off the
10 record and talk to my client for just a
11 second if you don't mind.

12 HEARING OFFICER ANTONIOLLI: Okay.
13 Why don't we take a break right now. We can
14 go off the record. We'll take a ten-minute
15 break and come back at 2:45.

16 (Whereupon, after a short
17 break was had, the
18 following proceedings
19 were held accordingly.)

20 HEARING OFFICER ANTONIOLLI: Okay.
21 We're back on the record, and we will
22 continue with questions by the Agency.

23 BY MS. WILLIAMS:

24 Q. I guess, Dr. Anderson, maybe I

1 apologize for some confusion because I felt that at
2 the last hearing we were all in agreement that the
3 graded approach for evaluating radiation doses to
4 aquatic and terrestrial biota was a model rather
5 than an observational or experimental study?

6 A. I mean it's a standard methodology.
7 Everything is a model, your entire regulatory
8 framework is a model because you don't go out and
9 look at the actual impacts, you set standards based
10 on toxicological studies and then assume it's going
11 to be protected.

12 Q. And toxi- -- by that, toxicological
13 studies, you mean studies in a laboratory that look
14 at impact --

15 A. They look at three things: One, the
16 species -- a particular species, a dose and the
17 impact of that species. And the reason there is no
18 work done with radium like that is A, you're
19 interested in the impacts on radiation and B, radium
20 is too dangerous to work with.

21 Q. But you agree there's no work like
22 that that's been done with radium?

23 MR. FORT: I would like you to let him
24 finish his sentence. I mean he says

1 something and then you say but you agree.

2 MS. WILLIAMS: I thought he was
3 finished. Were you not finished?

4 THE WITNESS: No. What I'm saying
5 is --

6 MS. WILLIAMS: I thought he answered
7 the question I should say actually. I asked
8 the question and I think he answered it,
9 but ...

10 THE WITNESS: Okay. What I'm -- all
11 I'm saying is is that it would not be prudent
12 to look at impacts of radiation on biological
13 species in the laboratory using radium as the
14 source of radiation. There are much safer
15 things, much more available things. Things
16 that don't degrade radon and cause problems
17 because it's a gas so that so ...

18 BY MS. WILLIAMS:

19 Q. But you agree, right --

20 A. I agree --

21 Q. -- that there are none -- there
22 have -- there are no lab studies done?

23 A. I would not say definitively there are
24 none. There are none on the ecotox database which

1 is probably what IEPA consulted.

2 Q. Okay. And that would be normal in
3 setting water quality standards to consult that
4 database, right?

5 A. Well, if it's a radionucleotide, it
6 would also be normal to look at the radiological
7 literature to determine if radiation harms plants
8 and animals, and it does.

9 Q. And I'm getting the assumption from
10 what you're telling me then that your criticism is
11 that we should have looked at radiation generally
12 rather than focusing in, narrowing in on radium in
13 particular, correct?

14 A. Not really because in terms of
15 fate/transport where it bioaccumulates, that is a
16 function of the chemical reactivity of the
17 radionucleotide. In terms of the damage it does,
18 that's purely a function of the radiation.

19 Q. So if we were to set a standard of
20 water quality standard for radiation generally,
21 would that address the concerns that you're
22 expressing?

23 A. As a general water quality standard?

24 Q. Right, if we had a general water

1 quality standard of X number of picoCuries per liter
2 of radiation?

3 A. Absolutely.

4 Q. Are you aware if we have any such
5 standards in Illinois right now?

6 A. For general water quality standards?

7 Q. Uh-hum.

8 A. My understanding is you do not.

9 Q. You're not aware that -- Well, there
10 are no general water use -- general use water
11 quality standards for radiation is what you're
12 saying to the best of your knowledge?

13 A. The one picoCurie per liter radium 226
14 is the only one that I'm aware of.

15 Q. Are you aware if they have a gross
16 beta standard?

17 A. I am not aware of that.

18 Q. If there was a gross beta standard,
19 would that address some of your concerns about there
20 being no --

21 A. Well, radium 226 is primarily an alpha
22 emitter so not necessarily.

23 Q. Are you familiar with part 302 of 35
24 Illinois Administrative Code where the Agency has

1 its water quality standards?

2 A. No.

3 Q. Are you aware of what assumptions were
4 used in developing the DOE screening tool?

5 MR. FORT: I'm sorry, what was the
6 question?

7 BY MS. WILLIAMS:

8 Q. What type of assumptions were used
9 about exposure, time, method, concentration, whether
10 there was dilution?

11 A. It's all discussed in the material in
12 the standard --

13 THE COURT REPORTER: I'm sorry, in the
14 standard what?

15 BY THE WITNESS:

16 A. It's all discussed in the standard. I
17 mean, I'm aware of what's in that document.

18 BY MS. WILLIAMS:

19 Q. The assumptions are all discussed,
20 okay.

21 A. Did I memorize it? No.

22 Q. But it's true, correct, that the
23 document assumes no dilution, it assumes a constant
24 concentration?

1 A. No, I don't think that that's true
2 because these are contaminated sites, contaminated
3 with uranium -- with some radionucleotide, and there
4 are -- they don't deal with assumptions, for
5 example, about organisms coming and going from the
6 site and those exposures so it isn't necessarily an
7 assumed that there's a constant exposure.

8 On the other hand, what you're
9 proposing, if you're sampling quarterly for these
10 things, it sounds like you're making the same
11 assumption anyway. Otherwise, why would you sample
12 periodically?

13 Q. Are you asking me a question now?

14 A. No, I'm not. Sorry.

15 Q. Isn't it true that the DOE screening
16 tool assumes, for example, that a riparian mammal
17 would get all his food, all his water from that
18 particular source?

19 A. It could. I mean, I think that's
20 reasonable and that's not necessarily an illogical
21 assumption if you're talking about something like a
22 raccoon living in the riparian corridor next to a
23 stream --

24 Q. Twenty-four hours a day, seven days a

1 week?

2 A. How long is the riparian corridor?

3 Q. Three hundred sixty-five days?

4 A. How far is the level of contamination?

5 Q. In the middle of the stream?

6 A. In the middle of the stream?

7 Q. And assumes that there's --

8 A. Outside of --

9 THE COURT REPORTER: I'm sorry.

10 HEARING OFFICER ANTONIOLLI: Okay.

11 For the court reporter, let's not talk over

12 each other.

13 BY MS. WILLIAMS:

14 Q. Isn't it true that it assumes that a
15 riparian mammal would be in the middle of the
16 stream, 24 hours a day, seven days a week, 365 days
17 a year?

18 A. Not a riparian mammal, we don't have
19 dolphins. Well, it assumes that it's eating and
20 drinking from the stream predominantly.

21 Q. Isn't riparian mammal the term that is
22 used in this document?

23 A. Riparian refers to the area next to
24 the stream, vegetated cover.

1 MS. WILLIAMS: Could you read back for
2 me what he said it assumes?

3 (Whereupon, the requested
4 portion of the record
5 was read accordingly.)

6 BY THE WITNESS:

7 A. The riparian area is the vegetative
8 zone next to the stream, it's next to the stream. I
9 think what I said previously was that it is not
10 unreasonable to believe that a riparian mammal would
11 drink and eat from the stream.

12 BY MS. WILLIAMS:

13 Q. My question really wasn't was it
14 reasonable to believe, my question was that an
15 assumption that this model was based on in order to
16 achieve the calculations that are in your testimony?

17 A. The latter one I do agree with.

18 Q. The answer is yes?

19 A. Yes.

20 Q. I'd like to go over a few of the
21 bullet points in your testimony, if that's okay.
22 The second bullet point on Page 2 of the version
23 that was originally filed states: There is 50 years
24 of data identifying the various negative impacts of

1 radiation upon a spectrum of animals and plants.

2 Can you tell us what the dose
3 rates are that are associated with specific negative
4 impacts?

5 A. You -- I would --

6 MR. FORT: Object to the --

7 THE WITNESS: -- refer --

8 MS. WILLIAMS: Or one negative impact.

9 BY THE WITNESS:

10 A. I would refer you to the Patuxent
11 study, the citation is Ronald Eisler --

12 BY MS. WILLIAMS:

13 Q. Uh-hum.

14 A. (Continued.) -- synoptic -- or impacts
15 of radiation on wildlife and fish and invertebrates
16 a synoptic guide.

17 Q. Okay.

18 A. In that, again, 147-page document and
19 he presents table after table of species, the
20 isotope that was used to assess the radiation
21 impacts, the level of -- the dosage of radiation and
22 the various observable impacts.

23 Q. Was that the type of information that
24 was used in developing this DOE?

1 A. Oh, sure.

2 Q. Do they cite in the Patuxent study?

3 A. I don't remember. Eisler might have
4 even been on the BDAC, I didn't --

5 THE COURT REPORTER: I'm sorry, I
6 can't hear you.

7 THE WITNESS: I'm sorry. Eisler might
8 have even been on BDAC, I didn't review the
9 membership.

10 BY MS. WILLIAMS:

11 Q. What's BDAC?

12 A. The Biota --

13 Q. Oh, BDAC.

14 A. -- Dose Assessment.

15 Q. In your second --

16 MR. FORT: Excuse me, just a second.
17 Just for the record, the reference study is
18 listed on the references in the document
19 we've marked as Exhibit 15, the Biota Dose
20 Assessment Committee document.

21 MS. WILLIAMS: Which module or portion
22 of the study have the cites in it?

23 MR. FORT: Well, it's in the first
24 part, it's for Module 1 so it's the

1 reference --

2 MS. WILLIAMS: Okay. The preliminary.

3 MR. FORT: -- at the beginning. It's

4 really the outline and the list of

5 references, it's at the very beginning.

6 MS. WILLIAMS: Okay.

7 MR. FORT: And that's all part of it.

8 MS. WILLIAMS: Thank you.

9 HEARING OFFICER ANTONIOLLI: Okay.

10 BY MS. WILLIAMS:

11 Q. In bullet point No. 3 you state that
12 it isn't necessary to do species specific studies on
13 whether radium can harm a particular species
14 inhabiting Illinois.

15 Are you aware of what species
16 would be the most sensitive?

17 A. The limiting factors used by BDAC for
18 one rad per day aquatic wildlife, that what they
19 cited was gametogenesis -- interruption of
20 gametogenesis in fish, and I actually believe for
21 the .1 they didn't specifically reference it beyond
22 riparian wildlife, what the actual mechanism is,
23 it's probably the same mechanism that causes cancers
24 and fatality in humans. I mean, they're mammals.

1 Q. Right. And they -- so they didn't
2 reference this particular species for the .1 rad?

3 A. I don't have any recollection of any
4 specific reference than -- other than saying that it
5 was terrestrial mammals because they're higher on
6 the --

7 Q. Right.

8 A. -- phylogenetic tree.

9 Q. And had they used the species that
10 were referenced, which I'm not going to try and
11 pronounce, gametos --

12 A. Gametogenesis in fishes? Again,
13 that's for the aquatic.

14 Q. Okay. And that would have resulted in
15 a much higher number than this 3.75 picoCuries per
16 liter?

17 A. If you used -- if you ignored the
18 wildlife in the riparian zone that feeds and is
19 supported, drinks and eats --

20 Q. Well, I'm not saying that but if
21 you --

22 MR. FORT: Excuse me.

23 MS. WILLIAMS: He's not answering my
24 question, that's why I'm clarifying.

1 MR. FORT: Well, but let him finish
2 his question, maybe he'll get to the rest of
3 your question, you know, if you give him a
4 chance.

5 HEARING OFFICER ANTONIOLLI: Okay.
6 You can go ahead and finish answering and
7 then you can continue.

8 BY THE WITNESS:

9 A. Yeah. If you do not consider riparian
10 wildlife at all, the potential impact to them, then
11 the -- it would lead to a higher number than 3.75,
12 that's correct.

13 BY MS. WILLIAMS:

14 Q. In your fifth bullet point you state
15 that no increase in radiation above background
16 levels is without risk.

17 Wouldn't drinking levels above
18 background then involve a risk?

19 A. Absolutely, that's why the MCL is
20 promulgated. And if it went from five to zero,
21 there would be even less risk.

22 Q. Less risk, that's my question. Are
23 you recommending that we ban drinking water with
24 levels above zero?

1 A. This has been a 20-year debate
2 extensively -- intensively studied, intensively
3 debated. I'm comfortable with the federal MCL at
4 five picoCuries per liter for drinking water.

5 Q. Then can you explain for the Board why
6 you're comfortable with five picoCuries per liter
7 for human consumption but you're recommending in
8 your testimony retention of one picoCuries per liter
9 for water that's discharged today from a sewage
10 treatment plant to a low-flow stream?

11 A. Okay. Yeah, I can do that. Well,
12 first of all, you have to remember that one -- that
13 this current standard is one picoCurie per liter
14 radium 226.

15 Q. Okay.

16 A. There will be a concomitant
17 contribution from 228, it runs -- could run 40 to
18 60 percent either way so really one is two so we're
19 already at two. If -- Do you understand that?

20 Q. Well ...

21 A. That's really key because there is
22 some confusion in the record before the Board.

23 Q. Uh-hum.

24 A. It over and over states that we're

1 moving the standard from one picoCurie to four or to
2 five, it's one picoCurie radium 226, it's five
3 picoCuries combined --

4 Q. Correct.

5 A. -- 226, 228 so that's an important
6 consideration. If you have a situation where you're
7 delivering water -- drinking water at five
8 picoCuries, and let's say the water where -- that
9 you don't concentrate the radium and you send it to
10 a sewage treatment plant at five picoCuries, you're
11 going to lose part of it to the sediment, roughly
12 half, depending on the proportion of radium 226,
13 228, depending on the absorption levels of the
14 sludge in the treatment plant but 50 percent is a
15 reasonable calculation, so you've got 2.5 going out
16 into the stream which is pretty close to the two.

17 So -- and what I -- and I'm
18 recommending one be put in place because the
19 proposal is to eliminate it completely and have no
20 standard.

21 Q. So if there was a different number in
22 place, you might recommend a different combined
23 standard rather than the existing one picoCurie per
24 liter of radium 226?

1 A. I think now that you've clearly
2 reviewed the graded approach and started to look at
3 the numbers, there may be a reasonable way to
4 address the concerns of POTWs that might have
5 trouble meeting the one picoCurie per liter
6 standard. But it's sure not a rational approach to
7 do away with the standard for everybody to address
8 the needs for a few POTWs as per the IEPA testimony.

9 Q. I understand. In general, would you
10 say it's better to have -- in general, would you say
11 a combined standard of radium 226 and radium 228
12 would be preferable to just a radium 226 standard?

13 A. Yeah, probably. And you could even go
14 to alpha emitters, a combined -- a standard that
15 dealt with all alpha emitters.

16 Q. Are you aware of what the drinking
17 water standard is for alpha emitters?

18 A. Fifteen? Fifteen or 20.

19 Q. I think 15 is correct. Are you aware
20 of what the drinking water is for beta?

21 A. No.

22 Q. Are you aware of what the Department
23 of Energy effluent limit is for radium for -- Well,
24 I don't think it's the Department of Energy -- what

1 nuclear power plants' effluent is regulated by?

2 A. I don't think I do. I don't think
3 I've seen that.

4 Q. You spend a significant portion of
5 your bullet points referring to a study out of
6 Florida?

7 A. Uh-hum.

8 Q. I believe you call it Technical Report
9 to the Southwest Florida Management District 2000.

10 A. Uh-hum.

11 Q. In your what is the first bullet point
12 on my Page 3 --

13 A. Okay.

14 Q. -- it starts radium is closely related
15 chemically to calcium?

16 A. Yes.

17 Q. You state in there that it moves
18 easily through the environment?

19 A. Right.

20 Q. Isn't that statement contradictory to
21 the Florida study on Page 7?

22 A. Which says?

23 Q. If you would like to take a look at
24 it.

1 MR. FORT: You're referring to one of
2 the attachments to Mr. Adam's testimony?

3 MS. WILLIAMS: Exhibit H.

4 HEARING OFFICER ANTONIOLLI: It would
5 be D.

6 MS. WILLIAMS: Exhibit D? Did I get
7 it wrong?

8 HEARING OFFICER ANTONIOLLI: Uh-hum.
9 Attachment D.

10 BY MS. WILLIAMS:

11 Q. Sorry. Yeah, Page 7, Paragraph 2 of
12 Exhibit D. It says the last sentence referring to
13 radium, consequently it is usually not a mobile
14 constituent in the environment?

15 A. Well, you have to read the sentence --
16 the rest of the sentence.

17 Q. Okay. Go ahead, read the rest of the
18 sentence.

19 A. Radium does not degrade in water by
20 means other than radioactive decay, and it may be
21 readily absorbed by soils.

22 Q. Soils.

23 A. Absolutely. Consequently, it's
24 usually not a mobile constituent in the environment.

1 That's specifically referring to its affinity to
2 build up in things like sewer sludge and sediments.

3 Q. Well, what is your --

4 A. But the components that don't are
5 biologically mobile. I mean, that's how human
6 cancers develop, it's absorbed into the bones and it
7 irradiates the bone marrow.

8 Q. Do you know what those percentages
9 are?

10 A. Well, I've seen numbers in absorption
11 in sediments and sewer sludge range from 20 to
12 80 percent.

13 Q. It's very variable, the data that's
14 out there?

15 A. Yes, absolutely. That's why I
16 testified previously that often they use 50 percent
17 when it ends up in the sewage treatment plant but
18 it's highly variable.

19 Q. Would some of that variation be based
20 on solubility?

21 A. Well, solubility is a consideration
22 and if radium is in a soluble state, it's probably
23 less problematic, for example, than radium that's
24 precipitated out using HMO. A precipitant that

1 forms it as a particle, if you then take it and land
2 apply it, that's problematic; you get an earthworm
3 picks up a particulate form of radium rather than it
4 being evenly spread across the land, so it's just
5 another way that it's concentrated.

6 So yes, the form that it exists in
7 can affect its mobility and the potential pathways
8 for exposure for biomagnification through the
9 ecosystems.

10 Q. Do you think it would need to be
11 soluble to be -- for there to be an uptake by
12 mollusks for example?

13 A. No. You know, in the Florida study
14 they actually -- I think, I don't know, I'm
15 trying -- I was trying to read between the lines
16 frankly.

17 Q. Right.

18 A. And this is purely a judgment, you
19 know, they don't say this, but they seem surprised
20 at the levels of concentration. It might be because
21 it's a siphon feeder and it's taking in
22 particulates, it could also be because for some
23 reason the muscle -- I mean, the muscle in the
24 mussel -- has a particular affinity for the soluble

1 form, it's -- that's very speculative. I don't
2 know.

3 Q. I believe you said that like calcium
4 if it is taken in by the organism, it would
5 primarily concentrate in the bones or like mollusk
6 shells?

7 A. Those are places where there is a lot
8 of calcium. I mean, typically in vertebrates it's
9 skeletal system, nerves and muscles.

10 Q. And I would assume for humans and for
11 larger mammals it's safer that it be there than in
12 the flesh, correct?

13 A. No. No, the bone is the most
14 dangerous place because it's a carcinogen.

15 Q. Right, but if it's in -- I'm sorry,
16 being in the mussel shell or the fish bone --

17 A. Oh, we're talking -- I'm sorry.

18 Q. -- if you're to -- as a predator.

19 A. Yes. Yes, because they would be
20 eating the flesh.

21 Q. Okay. With regard to the Florida
22 study, that was a study of Round Lake; is that
23 correct?

24 A. That was one of the lakes studied.

1 Actually, I remember there were several.

2 Q. There was only one lake from which
3 they took water samples I believe, correct?

4 A. Yeah.

5 Q. And that was Round Lake?

6 A. I believe so.

7 Q. Do you know -- are you aware of what
8 the loading of radium was to that lake? I believe
9 the study talks about the concentration. Do you
10 know if it talked about the loading? And do you
11 know what I mean by loading when I say that?

12 A. Yeah, you're talking about the
13 concentration of radium in picoCuries per liter.

14 Q. But I mean are -- no, I know it talked
15 about the concentration but it didn't talk about the
16 quantity. So in that study I guess for folks that
17 probably didn't read it, water was being pumped from
18 the groundwater into the lake, correct?

19 A. Yeah, it was being supplemented.

20 Q. Do you know how much groundwater was
21 pumped into the lake?

22 A. I'd have to -- I would have to refer
23 to the document. Sorry.

24 Q. Do you know why they needed to pump

1 groundwater into the lake?

2 A. Well, actually, it was drawn down
3 associated with the -- I think they were just
4 supplementing it to keep the water level high for
5 the benefit of wildlife and the fish.

6 MR. FORT: Mr. Adams has further
7 information on that.

8 MS. WILLIAMS: Well, we can talk about
9 it when we get to his testimony then.

10 MR. FORT: I didn't know if you wanted
11 the answers here or someplace else.

12 MS. WILLIAMS: No, that answer can
13 wait.

14 BY MS. WILLIAMS:

15 Q. Do you know if that study was ever
16 peer-reviewed or published?

17 A. Technical reports are not typically
18 peer-reviewed.

19 Q. Can you think of any real world
20 examples in Illinois that would be comparable to the
21 facts in the Florida study where groundwater was
22 being used to recharge a lake for example?

23 A. You know, we get 60 inches of rainfall
24 per year. We have severe strains on our drinking

1 water supplies, I would not be surprised if it's not
2 atypical. I mean, I can't think of a situation.

3 Q. Right.

4 A. It's not impossible. Some homeowners
5 association who lost their lake and has the money
6 might be happening, but I can't -- I wouldn't do it
7 in northeastern Illinois.

8 Q. And isn't really that the conclusion
9 of the Florida study that that's probably not the
10 best idea to take high radium groundwater and
11 recharge your lake with it?

12 A. That's one of the conclusions. I
13 would also conclude that you shouldn't discharge
14 radium into aquatic systems at all if you can help
15 it, if there's any economically feasible
16 alternatives.

17 Q. But you're not -- again, you're not
18 recommending that we don't use this water for
19 drinking?

20 A. This water?

21 Q. That we -- you don't recommend that we
22 ban using high radium groundwater for drinking if it
23 can meet the MCL?

24 A. If it can meet the MCL for drinking

1 water, no, I agree with that.

2 Q. Are you aware of whether the Florida
3 study -- Strike that.

4 Isn't it true that the Florida
5 study didn't conclude a specific adverse impact on
6 the mussels in Round Lake?

7 A. No, I think their concerns were the
8 things that would be eating the mussels and the
9 biomagnification process that would move it up in
10 the food chain.

11 Q. And they also concluded they didn't
12 have enough information to determine whether any
13 specific animals that might be eating these mussels
14 would be in danger, correct?

15 A. And that is not uncommon with any
16 pollutant. It's very difficult to demonstrate that
17 the pollutant itself was the cause of any lethality,
18 mortality or loss, that's very difficult and
19 expensive work and it's not typically done; that's
20 why the regulatory framework is a model.

21 Q. Do you know anything about the
22 geologic formation at the bottom of Round Lake and
23 what it's composed of?

24 A. Gosh, I don't recall. I don't recall

1 a discussion of that. I'm sorry.

2 Q. Do you recall if they took any pH
3 samples in that study of the lake?

4 A. Oh, I'm sure they did, but I don't
5 remember them. I mean, that's typical when they're
6 doing a water quality study.

7 Q. It would be typical to take a pH
8 sample when you're doing a water quality study?

9 A. Yes. Right.

10 Q. Do you know if the state of Florida
11 took any action in response to this Round Lake
12 study?

13 A. No, but Ted may. Do you know?

14 DR. ADAMS: I don't believe they did
15 at the time.

16 BY MS. WILLIAMS:

17 Q. In the very last paragraph -- full
18 paragraph I guess of your testimony you state that
19 in your opinion if there is affordable technology
20 available that avoids the need to reintroduce radium
21 to the environment, it should be employed.

22 Is it your testimony that the
23 Board should set new best available technology for
24 drinking water beyond that established by USEPA?

1 A. I would not presume to tell the Board
2 what it --

3 HEARING OFFICER ANTONIOLLI: Could I
4 have you both speak up a little bit more just
5 for the public too?

6 THE WITNESS: I would not presume to
7 tell the Board what it should -- should or
8 should not be doing in that regard.

9 MEMBER RAO: Just as a matter of
10 clarification about that particular
11 statement. Were you talking about this
12 affordable technology for treating -- for
13 drinking water, or ...

14 THE WITNESS: Once you concentrate the
15 radium to reduce the radium level in their
16 delivered drinking water, I mean the best and
17 most logical thing is to remove the radium
18 from the system, it avoids what are likely
19 detrimental which -- what will be detrimental
20 impacts on the biota, but it also just takes
21 it out of the system. You don't have to deal
22 with any of these issues of exposure to
23 sewage treatment workers, you don't have to
24 deal with potential exposure pathways with

1 land application; you get it out of the
2 system, you put it in a storage facility, you
3 don't have to deal with it. You don't have
4 to deal with potential costs associated with
5 it building up in the sediments.

6 What if you've got to dredge those
7 sediments some day? Now they're hot and it's
8 incredibly expensive. It's just the logical
9 approach in my opinion, but I do not presume
10 to testify that there is an economically
11 feasible way. There are other folks who are
12 more informed in that regard, that is not my
13 expertise.

14 MEMBER RAO: And this technology that
15 you're referring to is more towards
16 getting -- you know, dealing with radium post
17 drinking water --

18 THE WITNESS: Yes.

19 MEMBER RAO: -- treatment?

20 THE WITNESS: Yes.

21 MEMBER RAO: So because when
22 Ms. Williams mentioned best available
23 technology, that's USEPA --

24 THE WITNESS: Terminology.

1 MEMBER RAO: -- yeah, terminology
2 which applies to drinking water.

3 THE WITNESS: And I have no expertise
4 in that.

5 MEMBER RAO: Thank you very much.

6 MEMBER GIRARD: Could I just --

7 MS. WILLIAMS: Yeah.

8 MEMBER GIRARD: So just to clarify the
9 clarification. You think it should be a
10 public policy goal for the state of Illinois
11 to remove radium from the environment when
12 possible.

13 THE WITNESS: Absolutely. Because as
14 a radiation source wherever you put it, if
15 it -- if any organism can come into contact
16 with it, even for small periods of time, it
17 increases risks of detrimental biological
18 effects, it's just the nature of radiation.

19 MEMBER GIRARD: Thank you.

20 BY MS. WILLIAMS:

21 Q. Do you have an opinion on what the
22 background level of radium is in the northern part
23 of Illinois that we're discussing?

24 A. No, I don't.

1 Q. There were some exhibits attached to
2 Mr. Adam's testimony that were maps --

3 A. Yes.

4 Q. -- about endangered species? Have you
5 reviewed those?

6 A. Yes, I have.

7 Q. I'd like to direct you to one in
8 particular, this is not our area of expertise, it's
9 the Department of Natural Resources as you
10 indicated. This map is -- I believe it was Exhibit
11 E, is that --

12 HEARING OFFICER ANTONIOLLI: I think
13 there were two maps, so ...

14 MS. WILLIAMS: There was one in --
15 Exhibit A had one map, Exhibit E had several.

16 HEARING OFFICER ANTONIOLLI: This is
17 Exhibit E.

18 MS. WILLIAMS: Right.

19 HEARING OFFICER ANTONIOLLI: Okay.

20 MS. WILLIAMS: And I think it's the
21 sixth one though they're not numbered. I
22 believe it's titled Distribution Area
23 Lampsilis higginsii.

24 THE WITNESS: Higginsii mussel I

1 believe, yes.

2 BY MS. WILLIAMS:

3 Q. Is that it?

4 A. Uh-huh.

5 Q. Is it your testimony that that's an
6 accurate reflection of the range of that species?

7 A. Well, first of all, this isn't part of
8 my testimony, but ...

9 Q. No.

10 A. But I do have some expertise in this
11 regard. These -- my understanding is these are
12 historic ranges for these threatened and endangered
13 species. They do not imply that the shaded area is
14 a place where that threatened endangered species is
15 currently found. If it was, it wouldn't probably be
16 endangered because there would be a lot of them but
17 that's what this is.

18 Q. And would you agree that's true of all
19 the maps they provided?

20 A. Yes. So what this is trying to -- I
21 think the point that they're trying to make, you
22 know, and I don't mean to speak for you, but is that
23 you could impair the recovery of the threatened or
24 endangered species if it meets these habitats within

1 its specific range and they're no longer potentially
2 available because of the impacts of radium
3 discharge.

4 Q. Is that how the Department looks at
5 whether potential impacts will result in taking of a
6 threatened or endangered species?

7 A. It is a consideration. The impact on
8 potential habitat is something that is considered
9 but frankly you need to consult with the department.

10 Q. Okay. And are you aware of that
11 particular endangered species where it's found?

12 A. I'm personally not familiar with that
13 particular organism. I'm a bird guy and lots of
14 other things but not a mussel guy.

15 Q. I could ask lots of things about
16 birds, but I'll stick to this subject here.

17 A. I'd love to answer.

18 MS. WILLIAMS: I think I'm almost done
19 with Dr. Anderson, but I'd like to talk with
20 my folks real quick.

21 (Whereupon, a discussion
22 was had off the record.)

23 MS. WILLIAMS: I think that's all I
24 have for Dr. Anderson. It's up to the Board

1 whether you'd like folks to finish asking him
2 questions and then move on to Dr. Adams?

3 HEARING OFFICER ANTONIOLLI: You can
4 go ahead and ask Dr. Adams as well unless
5 you'd like to take a break.

6 MS. WILLIAMS: That's fine. A break
7 is always good, but I can keep going. Hi,
8 Mr. Adams, how are you?

9 THE WITNESS: Good, thanks.

10 HEARING OFFICER ANTONIOLLI: At this
11 point you may have questions that may answer
12 other peoples' questions and we'll let you
13 ask them. You're lucky.

14 MS. WILLIAMS: Yeah, I'm so lucky.

15 HEARING OFFICER ANTONIOLLI: And we
16 can also take another break shortly, so ...

17 MS. WILLIAMS: Find Dr. Adams'
18 testimony first.

19 D I R E C T E X A M I N A T I O N

20 By Ms. Williams

21 Q. Okay. On the first page of your
22 testimony, Dr. Adams, you state something that I
23 think is new to me anyway. You state that the
24 existing standard of one picoCuries per liter for

1 radium 226 generally is recognized as a background
2 condition in surface waters of Illinois and then you
3 provide a citation.

4 Could you explain that to us a
5 little bit more?

6 A. Explain?

7 Q. Well, I have not read this attached
8 publication. So are you saying it's -- what do you
9 mean by generally recognized I guess?

10 A. Oh, okay. Yeah, I think if you look
11 at typical literature that documents the background
12 levels of radium 226 or other radionuclide for that
13 matter, that in Illinois you would see in surface
14 waters background ranges that would be less than one
15 picoCurie --

16 Q. Less than one?

17 A. -- per liter and up to one, it varies,
18 it varies. So I was trying to give an idea, an
19 average background concentration that we could start
20 from.

21 Q. Do you recall Mr. Mosher talked about
22 data from the Fox River that we had that found the
23 concentration at 0.1 picoCuries per liter? Would
24 you find that to be a common background that might

1 be found?

2 A. I think it would be within the range.
3 I don't remember it specifically, but I would say
4 that it can be less than one and up to one up to
5 two.

6 Q. Would you mind providing this article
7 to the Board that you cite?

8 MR. FORT: We'll get the reference.

9 We'll get it.

10 MS. WILLIAMS: Okay. Thank you.

11 BY MS. WILLIAMS:

12 Q. Is it your testimony that the Board
13 was intending to set the water quality standard at
14 background?

15 A. No.

16 Q. No. Your testimony is that it's a
17 coincidence the water quality standard is the same
18 as what you consider background?

19 A. I think what I was communicating and
20 testifying is that one picoCurie per liter current
21 standard is at or near Illinois surface water
22 background and that that being the case and there
23 was no -- the Agency hasn't provided any further
24 justification to change that particular standard,

1 that I would support leaving the standard at one.

2 Q. Okay. But you're not aware if the
3 Board considered what background levels were when
4 they adopted this standard?

5 A. No, I'm not.

6 Q. Also on that page you said it appears
7 that any increase over the existing standard could
8 result in an excessive radium exposure.

9 Would you tell us what you mean by
10 excessive? Do you see where I'm reading from?

11 A. Right. Okay. I think we need to go
12 back to the sentence just before that so that we can
13 pick up: By doing so, any variations from that
14 standard would require careful consideration. From
15 the analyses I have performed, and those analyses
16 would be based on the bio dose assessment
17 calculations, which would indicate that anything
18 over, depending on the calculation, 1.36, 1.88 which
19 is clearly above one, then there could be the
20 potential of an adverse effect on the aquatic
21 organisms and it clearly would exceed or does exceed
22 the limiting requirement that's established by the
23 BDAC.

24 Q. What exceeds the BDAC?

1 A. If there was an increase in the
2 picoCurie per liter concentration in the range of
3 1.36 and 1.88.

4 Q. So by could result in excessive radium
5 exposure you're saying it could result in some
6 impact?

7 A. Correct.

8 Q. Because it would be?

9 A. That's correct.

10 Q. You don't know what impact that would
11 be?

12 A. (No audible response.)

13 THE COURT REPORTER: Is that a no?

14 THE WITNESS: Yes -- I'm sorry -- we
15 do not know, correct. I'm sorry.

16 BY MS. WILLIAMS:

17 Q. When we were talking about the biota
18 dose committee approach, that's this report, right,
19 that's been entered as an exhibit?

20 A. That's correct.

21 Q. And we discussed that briefly at the
22 last hearing too, correct, or no?

23 A. We introduced it, I don't think we did
24 discuss any details.

1 Q. Is this a regulatory requirement, this
2 approach?

3 A. It is a standard that is used by the
4 DOE, it is established on the DOE contractors.

5 Q. And how do they use that standard as
6 you put it?

7 A. As part of their environmental
8 monitoring program DOE requires all of its
9 contractors as part of reporting the environmental
10 monitoring results humans, for the public, the
11 worker and the environment, it is part of the annual
12 environmental report that the DOE contractors put
13 out every year.

14 Q. And if the contractor finds values
15 that exceed the screening tool, isn't it correct
16 that the next step is then to do further tests?

17 A. That is correct, the next step is to
18 do specific -- gather information, specific -- site
19 specific information gathering activities.

20 Q. Have you consulted with any of the
21 authors of this study --

22 A. Yes, I have.

23 Q. -- in preparation for this hearing?

24 A. Mr. Steve Domotor, he is the DOE

1 chairman of the BDAC.

2 Q. And isn't it true that Mr. Domotor
3 cautioned you against the use of this approach in
4 setting water quality standards?

5 A. Not to my knowledge. Not to my
6 recollection.

7 Q. He didn't suggest that this was overly
8 conservative for this purpose?

9 A. We talked about its use and the fact
10 that there were conservative assumptions put into
11 that approach, but that's part of the methodology.
12 It's part of the screening and then from the
13 screening one goes into more detailed site specific
14 information.

15 Q. Okay. Great. Thanks. Would you mind
16 maybe explaining for us in a little bit more detail
17 about some of these conservative assumptions, what
18 they are based on?

19 A. Well, there are a number of default
20 values, what you're calling input or conservative
21 values, they range anywhere from distribution
22 coefficient values that would be looking at how much
23 radium or radionuclide might be in the sediment as a
24 result of a certain concentration of radioactive

1 material in the water. It may also look -- or one
2 assumption would be how much time a particular
3 organism spends in the impacted area.

4 Q. And how much time is that?

5 A. It all depends on the individual.
6 There are default --

7 Q. What is the default value for that?
8 I'm sorry.

9 A. That is an approach. It's a limit, a
10 value and there's several of them so there's
11 probably 40 or 50 of them that are used to develop
12 the methodology or to exercise the methodology and
13 that depends on whether it's an animal or an aquatic
14 organism. So one can go to the default value table,
15 look at what that default value is and identify
16 that.

17 Q. Do you agree that the default value
18 for the riparian mammal was 24 hours a day exposure?

19 A. That was what the default value was,
20 that's correct.

21 Q. And it also -- the default value also
22 would assume that the mammal got all of its food,
23 all of its water --

24 A. That's also correct.

1 Q. -- from that? Is it also correct that
2 the default assumption is that there is a constant
3 concentration, no dilution coming in when it rains?

4 A. It is the concentration of the water
5 or the sediment set for that particular scenario so
6 it is --

7 Q. So it --

8 A. -- it is what it is being investigated
9 but the bottom line is that we're still measuring
10 against a limiting value of either one rad per day
11 or in the case of the riparian .1. So there's no --
12 there's no confusion that there are certain default
13 values that are being used and from that, one needs
14 to take the next step when you exceed the BCGs, the
15 Biota Concentration Guides, to gather more
16 information. That's what's required.

17 Q. Site specific information?

18 A. That's the way it's set up, there's no
19 surprises there.

20 Q. All right. That's helpful, thank you.

21 A. Okay. And I don't see the Agency
22 doing that.

23 Q. Right. And by what you mean you don't
24 see the Agency doing it, you mean you don't see us

1 gathering site specific data that could then be
2 plugged in to this model to determine what an
3 appropriate water quality standard would be for the
4 state of Illinois; is that correct?

5 A. That's correct.

6 Q. We have entered in now the entire DOE
7 document, correct?

8 A. That is my understanding.

9 Q. I believe. In your -- in exhibit to
10 your testimony, Exhibit C, you provided portions of
11 that document, correct?

12 A. Correct.

13 Q. And there is a table I believe at the
14 end of that. It's page M1-38. This -- is this --
15 this is one of the tables, right?

16 A. That's one of the tables, that's
17 correct.

18 Q. About how many tables are there, do
19 you know?

20 A. There are a number.

21 Q. And just explain -- I mean, I think I
22 understand but why don't you explain for everybody
23 why you put this one and not all the other ones?

24 A. Right. Well, the other tables --

1 there are different purposes for the other tables.

2 Q. Uh-hum.

3 A. This particular table, Table 6.2, is
4 entitled Biota Concentration Guides, BCGs, for Water
5 and Sediment. This particular table is in special
6 units as opposed to other units, special units being
7 our picoCuries per gram, picoCuries per liter, and
8 it's for use in aquatic system --

9 Q. Okay.

10 A. -- evaluations. And so what we have
11 here is a table that lists the radionuclides, it has
12 the established BCG for water and for sediment,
13 water being picoCuries per liter, sediment being
14 picoCuries per gram, and then the organism
15 responsible for limiting the dose in water or the
16 limiting dose in sediment. There are other tables
17 that provide other information like tables on the
18 default values, for example.

19 Q. Okay. And there would be a different
20 table, say, for aquatic life, this table?

21 A. There would be a different table for
22 terrestrial life.

23 Q. Okay.

24 A. There is another table in the -- for

1 aquatic systems in the other units.

2 Q. Okay. This is for an aquatic system
3 but it's looking at a riparian animal, right? So
4 there's also a table that would say aquatic systems
5 and aquatic animal, right, for radium? Here under
6 radium 226 and radium 228 it says riparian animal or
7 it only lists -- are you saying it only lists -- Go
8 ahead, maybe explain it.

9 A. No, go ahead.

10 Q. I've got to tell you I'm not sure,
11 this stuff is over my head I think, and I think it's
12 over the head of most of the folks that I usually
13 rely on to explain all this stuff. So do I look at
14 this table for aquatic systems and you're saying
15 another one for terrestrial systems?

16 A. That's correct.

17 Q. Can you tell me which table that would
18 be?

19 A. I can. If you give me the document, I
20 probably could identify it. Well, that's 6.2 but
21 I'm thinking it's either 6.1 or wait a minute. On
22 table -- excuse me -- Table 6.4.

23 Q. Okay.

24 A. Which is page M1-40, that is the

1 bioconcentration guide to water and soil in
2 terrestrial systems.

3 Q. Now I looked over this stuff this
4 morning and I think I understand now, best I'm ever
5 going to, how you did these calculations. Could you
6 maybe walk through them a little bit for the Board?

7 A. May I refer to my calculations in
8 my --

9 Q. Of course.

10 A. -- testimony?

11 Q. Sure.

12 A. I think it would be easier. You may
13 want to keep your finger or thumb on page M-38. I'm
14 going to use my amended version because the pages
15 are in the proper order. If we could go to Page B-5
16 in my testimony. And also hold --

17 Q. You mean Exhibit B, Page 5, is that
18 what you mean, or ...

19 A. Exhibit B, Page 5, correct.

20 Q. Okay.

21 A. I'll wait for everybody to get there
22 and we'll proceed.

23 Q. Okay. Was this page on the original?

24 MR. FORT: Yeah, it was in there, it

1 wasn't at the front of all the calculations.

2 HEARING OFFICER ANTONIOLLI: And
3 that's the reason for the amended pre-filed
4 testimony because now the pages --

5 MR. FORT: This is actually what they
6 called it, the Hearing Officer gave me, was
7 concerning about where it says Page B-5.

8 MS. WILLIAMS: Okay.

9 HEARING OFFICER ANTONIOLLI: Now, do
10 you want to take a break now before we go on?

11 MS. WILLIAMS: Fine.

12 HEARING OFFICER ANTONIOLLI: Why don't
13 we do that. Let's take a break, ten minutes.
14 It's about ten to now, we'll be back at
15 4:00 o'clock.

16 (Whereupon, after a short
17 break was had, the
18 following proceedings
19 were held accordingly.)

20 HEARING OFFICER ANTONIOLLI: We are
21 back on the record and it is about five after
22 4:00 now and --

23 MR. DOBMEYER: The EPA lawyer isn't
24 here yet.

1 HEARING OFFICER ANTONIOLLI: We'll
2 note for the record that she hasn't joined us
3 yet, but we will go ahead with a public
4 comment I believe.

5 MEMBER JOHNSON: There is an EPA
6 lawyer present.

7 HEARING OFFICER ANTONIOLLI: Deb
8 Williams is not in the room but we would like
9 to -- Are you prepared to go ahead with that
10 now?

11 MS. ADAMS: Yes.

12 HEARING OFFICER ANTONIOLLI: Okay.

13 MS. ADAMS: I'm Sarah Adams and I live
14 in Chicago but I have family in southern
15 Illinois, and they have a farm and they have
16 many creeks and little streams that go
17 through their farm as well as ponds that they
18 fish in and they also use well water and I
19 was very concerned about the water systems in
20 southern Illinois and my question for the EPA
21 would be why, if it's been the same for
22 however many years, why do you even want to
23 change it? So that's my question.

24 MR. MOSHER: Yeah, I think I can

1 answer that.

2 HEARING OFFICER ANTONIOLLI: Okay.

3 And --

4 MR. DOBMEYER: Sir, would you talk
5 louder, please.

6 HEARING OFFICER ANTONIOLLI: Would you
7 like to be sworn in? Can you swear him in
8 first?

9 THE COURT REPORTER: Do you solemnly
10 swear that the testimony that you are about
11 to give is the truth, the whole truth and
12 nothing but the truth?

13 MR. MOSHER: I do.

14 (Witness sworn.)

15 WHEREUPON:

16 ROBERT G. MOSHER,
17 called as a witness herein, having been first duly
18 sworn, deposeth and saith as follows:

19 MR. MOSHER: Okay. There is a radium
20 belt in northern Illinois, there are a few
21 cases of radium being found in groundwater
22 elsewhere in the state, in southern Illinois,
23 Sparta area has some radium in the
24 groundwater. This water quality standard has

1 been on the books since 1972, and we have, I
2 believe, gone on record to say that we have
3 not enforced this water quality standard as
4 far as regulating sewage effluents to this
5 point.

6 We realize that the communities
7 that are using this groundwater in these
8 areas of the state don't have another source
9 and that the common methods of treating that
10 water or not treating that water result in
11 compliance problems with the drinking water
12 standard of five picoCuries per liter.

13 When we looked at the dilemma that
14 these communities were in as far as having no
15 other source of water and yet being forced to
16 discharge to the waters of the state sewage,
17 we said well, let's go and look at that
18 radium standard to see if it's justified,
19 does it have to be one picoCurie per liter in
20 all waters of the state and that's what
21 really brought this rulemaking forth. If the
22 radium standard was not in question of being
23 met in its existing form, we wouldn't be here
24 today but it's these hundred plus communities

1 in the state that we felt we needed to do
2 something, we needed to look at the existing
3 standard, is it appropriate, is it overly
4 protective; we decided yes, it was, that's
5 why we're here.

6 To not address this standard,
7 which we are doing today, would -- and to
8 then begin to enforce it as permanent limits
9 for these sewage treatment plants would cause
10 widespread non-attainment no matter what
11 method people use to treat for radium in that
12 drinking water source.

13 So the Agency feels that we're
14 trying to set the water quality standards
15 right, just trying to get to look at what
16 science is available, set it right and we
17 believe doing that would take the problem of
18 discharge of the radium from the sewage
19 treatment plants and remove that as one of
20 the problems that these communities face.

21 MR. DOBMEYER: I have follow up.

22 HEARING OFFICER ANTONIOLLI: Would you
23 like to continue?

24 MS. WILLIAMS: Uh-hum. Hang on or can

1 you -- I'm sorry I was late, can you fill me
2 in on what we're -- are we opening up? I'm a
3 little confused.

4 HEARING OFFICER ANTONIOLLI: No, this
5 is a -- it was a comment by Clean Water and
6 they have a scheduling conflict and can't be
7 at the hearing tomorrow should it continue
8 and would you like to repeat your question
9 briefly?

10 MS. ADAMS: I was just wondering --

11 HEARING OFFICER ANTONIOLLI: Please
12 identify yourself too again.

13 MS. ADAMS: Oh, I'm sorry.

14 HEARING OFFICER ANTONIOLLI: Thank
15 you.

16 MS. ADAMS: I'm Sarah Adams, and I
17 said that I live in Chicago but I have family
18 in southern Illinois and they have a farm
19 that has creeks and rivers and stuff going
20 through there, and I was concerned about the
21 water systems in southern Illinois and I was
22 wondering why -- why even change the standard
23 if it's been the same way for so long so that
24 was my question.

1 MR. DOBMEYER: And I would like to
2 follow up on that, my name is Doug Dobmeyer.
3 I guess the -- what I've heard today from
4 science and from what I heard in Springfield
5 in April -- or on August 25th was the
6 sciences said this is either a dangerous
7 situation or we don't know what the hell it
8 is because we don't have enough science to
9 know what it is. And what I heard from the
10 EPA lawyer was well, don't worry about it,
11 we're going to do what we're going to do.

12 My question is if this is so
13 dangerous or if there's no science available,
14 why are -- why is the EPA even pushing this
15 standard? It sounds to me like there's a lot
16 of politics going on as opposed to science,
17 and I think this is a scientific issue.

18 MS. WILLIAMS: Can you -- I'm not sure
19 what you mean by politics, maybe could you
20 clarify that?

21 MR. DOBMEYER: Well, if you want to go
22 to Politics 101, we can do that over a beer
23 afterwards but I'm not going to sit here and
24 explain Politics 101. Politics is the give

1 and take in government, in society over
2 whether or not one standard or another
3 standard. If you really want to pursue that,
4 we can, but I think you know what I'm talking
5 about.

6 MEMBER JOHNSON: Let me, Bob -- and
7 because I think there's been some general
8 confusion and there's been some specific
9 confusion I think when I read the public
10 comments submitted by Clean Water.

11 Just as a follow-up to you and to
12 try and eliminate some confusion that might
13 be out there, there is the EPA or nobody for
14 that matter is proposing any change in
15 drinking water quality standards and -- water
16 quality standards for drinking water,
17 correct?

18 MR. MOSHER: Correct.

19 MEMBER JOHNSON: This is only, and I
20 think the confusion is there because we
21 continue to talk about the role of water
22 drinking and the removal of radium from the
23 drinking water has in the general water
24 quality standards which is what this proposed

1 change is regarding, correct?

2 MR. MOSHER: Correct.

3 MEMBER JOHNSON: Okay.

4 MR. DOBMEYER: Well, nonetheless,
5 there is a problem with the wastewater that's
6 left from the treatment of the drinking
7 water. I mean --

8 MEMBER JOHNSON: I was just trying to
9 clear up whatever confusion --

10 THE COURT REPORTER: I'm sorry, I
11 didn't hear the rest of your statement.

12 MR. DOBMEYER: I said there's a --
13 nonetheless, there's a problem with the
14 wastewater from the treatment of the drinking
15 water that puts, under the current
16 mechanisms, puts the water right back into
17 the environment thus, I think, increasing the
18 danger and I'm sorry, Mr. Johnson, you
19 started to say something?

20 MEMBER JOHNSON: No, and I was just
21 trying to clear up what I thought was a
22 specific misunderstanding in one paragraph in
23 your public comment and so -- and that's what
24 we're here to do, we're here to listen to

1 both sides of the issue and to come out with
2 a proposed rule for public comment sometime
3 in the future.

4 MR. DOBMEYER: I am really concerned
5 as well as other people that signed that
6 letter that Illinois is going to get
7 railroaded again through the system and
8 that's going to hurt the environment and
9 going to hurt the people and going to hurt
10 the wildlife.

11 MR. HARSCH: Madam Hearing Officer, I
12 would like to place this witness under oath
13 so he can testify --

14 MR. DOBMEYER: I would be glad to.

15 HEARING OFFICER ANTONIOLLI: And if
16 you -- Would you be willing to be sworn in
17 and testify?

18 MR. DOBMEYER: Absolutely.

19 HEARING OFFICER ANTONIOLLI: All
20 right. Can you go ahead and do that. I just
21 want to clarify also for the record before we
22 go ahead with any swearing in that it was a
23 public comment that we're referring to, it
24 was one that was filed on the 19th of October

1 and it was filed by Clean Water and it's on
2 the Board's website as well, so ...

3 MR. DOBMEYER: And I have copies if
4 anyone wants to see them.

5 HEARING OFFICER ANTONIOLLI: Uh-hum.

6 MR. HARSCH: I made that statement
7 because he signed in as a witness today.

8 HEARING OFFICER ANTONIOLLI: Right.

9 MR. DOBMEYER: I signed in because I
10 saw another person, I didn't know that we
11 weren't supposed to sign in.

12 HEARING OFFICER ANTONIOLLI: And if
13 you have --

14 MR. DOBMEYER: But that's the only
15 reason. But if you want to swear me in,
16 that's fine, I have no problem with that.

17 HEARING OFFICER ANTONIOLLI: We can
18 swear you in if you feel that you would like
19 to testify any further, but at this point --

20 MR. DOBMEYER: Well, I would like to
21 be equal with everyone else.

22 HEARING OFFICER ANTONIOLLI: Do you
23 have any further questions for the Agency?
24 Okay. Go ahead and swear him in.

1 THE COURT REPORTER: Do you solemnly
2 swear that the testimony that you are about
3 to give is the truth, the whole truth and
4 nothing but the truth?

5 MR. DOBMEYER: Absolutely.

6 (Witness sworn.)

7 HEARING OFFICER ANTONIOLLI: Does
8 anyone at this point have questions for
9 Mr. Dobmeyer?

10 MR. HARSCH: Or does he have anything
11 else to say?

12 MR. DOBMEYER: I have nothing else to
13 say, both Sarah and I have asked the
14 questions we wanted to ask.

15 HEARING OFFICER ANTONIOLLI: Okay.
16 And realizing this is an information
17 gathering hearing at this point and some of
18 the questions that you raised or at least
19 most of the questions that you raised may be
20 answered by the Board's opinion and order in
21 the rulemaking but if the Agency can answer
22 at this point, you can go ahead.

23 MS. WILLIAMS: If we can answer what?
24 I think there was a comment made, I don't

1 believe there was a question.

2 MR. DOBMEYER: The question that was
3 asked, Ms. Williams, why is the EPA doing
4 this that will hurt the people in the state,
5 hurt the environment. Mr. Mosher gave some
6 answers on it which I don't think addressed
7 the issue.

8 MS. WILLIAMS: I think he answered the
9 question.

10 MR. DOBMEYER: Well you were out of
11 the room, how would you know?

12 HEARING OFFICER ANTONIOLLI: Well, she
13 was here for much of what he said and I think
14 also that the question that you do raise is
15 one that will be addressed by the Board in
16 its opinion and order.

17 MR. DOBMEYER: Good.

18 HEARING OFFICER ANTONIOLLI: And
19 whether something is harmful to the
20 environment or to humans will be something
21 that the Board makes in its determination.

22 MR. DOBMEYER: Thank you.

23 MR. HARSCH: I have some questions of
24 the witness.

1 HEARING OFFICER ANTONIOLLI: Okay. Go
2 ahead.

3 WHEREUPON:

4 DOUG DOBMEYER,
5 called as a witness herein, having been first duly
6 sworn, depose and saith as follows:

7 DIRECT EXAMINATION

8 By Mr. Harsch

9 Q. Who is Clean Water Illinois?

10 A. It's a new organization that got
11 started specifically around this issue to address
12 water issues, this is the first point we've taken
13 up.

14 Q. Are you a registered lobbyist in the
15 state of Illinois?

16 A. No, I'm not. I have been registered
17 in the past, I'm not registered right now.

18 Q. Is Clean Water Illinois a
19 not-for-profit corporation?

20 A. It's not been incorporated yet.

21 Q. Do you have any business relationships
22 with WRT or any of the owners/operators --

23 A. No, but I have talked to them.

24 Q. You have no financial position with

1 respect to those areas?

2 A. No.

3 MS. WILLIAMS: Can you explain what
4 you mean when you say you talked to them?

5 MR. DOBMEYER: I've had conversations
6 with them just like I've had conversations
7 with Albert Ettinger, just like I've had
8 conversations with other people in this room.

9 MS. WILLIAMS: Have you contacted the
10 Agency up till now about your concerns?

11 MR. DOBMEYER: I sent a letter on the
12 19th electronically, it's posted on the
13 website.

14 MS. WILLIAMS: To the Board, right,
15 but to the Illinois EPA have you contacted
16 us?

17 MR. DOBMEYER: Well, I thought it was
18 inappropriate to do that since this is being
19 put before the Control Board and the
20 correspondence going to them.

21 MS. WILLIAMS: That's fine. Thank
22 you.

23 HEARING OFFICER ANTONIOLLI: Okay.
24 Thank you for your comments today, and I

1 think where we left off before we took a
2 break was with questioning by the Agency for
3 WRT environmental's witnesses.

4 MS. WILLIAMS: I apologize for not
5 being here when we reconvened to the Board
6 members in particular.

7 D I R E C T E X A M I N A T I O N

8 (Continued)

9 BY MS. WILLIAMS:

10 Q. Mr. Adams, I'm going -- I really don't
11 remember where I left off, I'd really like to start
12 fresh if that's okay with you?

13 A. Sure.

14 Q. On Page 2 of your testimony I believe
15 there's a statement that you feel the existing
16 standard may be appropriate; is that correct?

17 A. Could you help me find that, please?

18 Q. Yeah. In the second full paragraph,
19 the last sentence: If the Board wants to have water
20 quality standards that protect aquatic life and the
21 environment, it would appear that the existing
22 standard may be appropriate, correct?

23 A. That's part of my testimony, correct.

24 Q. Isn't it true that at the last hearing

1 Mr. Williams from WRT testified that the existing
2 standard was too low?

3 MR. FORT: I object, I think that's a
4 mischaracterization of the testimony. If you
5 want to point him to a particular transcript
6 and see the context of any question and
7 answer.

8 MS. WILLIAMS: I would like him to
9 answer the question.

10 HEARING OFFICER ANTONIOLLI: You can
11 answer the question if you can answer.

12 THE WITNESS: I don't recall. I
13 simply don't recall.

14 MR. FORT: Do you want him to answer
15 it?

16 MS. WILLIAMS: Are you aware of any
17 other --

18 MR. FORT: Would you like Mr. Williams
19 to answer since he's sitting here?

20 MS. WILLIAMS: Has he been sworn in?
21 It's fine with me.

22 HEARING OFFICER ANTONIOLLI: Yes,
23 together they have been.

24 MR. WILLIAMS: What I had stated if I

1 remember correctly, and I just read it again
2 last night, was that it is a low standard.

3 MS. WILLIAMS: Okay.

4 MR. WILLIAMS: I didn't say it was too
5 low?

6 MS. WILLIAMS: You didn't say too low,
7 you just said that it was low.

8 MR. WILLIAMS: I said it was a low
9 standard.

10 MS. WILLIAMS: Okay. I'm sorry for
11 mischaracterizing by saying too low.

12 BY MS. WILLIAMS:

13 Q. Are you aware of any other states with
14 standards as low as one picoCurie per liter of
15 radium 226?

16 A. No.

17 Q. But it's your recommendation that the
18 Board should retain the existing standard?

19 A. Well, my recommendation is the Board
20 has an existing standard that's one picoCurie per
21 liter, my question is on what basis are you using to
22 increase it? I think that's lacking in your bases.

23 Q. Okay. Well, and I think that's a
24 reasonable question but what I want to know is what

1 basis would you use to keep it at one?

2 A. I would use the BDAC which would
3 indicate part of the calculations in my testimony
4 that a water concentration in the range of 1.36,
5 1.88 without taking into consideration sediment does
6 not exceed the biota dose limits established by the
7 Biota Dose Committee.

8 Q. Do you know in Illinois what -- if
9 there's a number higher than that that would cause
10 no observed affect to aquatic life in Illinois?

11 A. I'm not sure I understand your
12 question. Is there -- please repeat it.

13 Q. I'm trying to get at how conservative
14 or not conservative your conclusion is. Are you
15 aware of a -- if we set it at two, would there be an
16 observed affect to aquatic life to your knowledge?

17 A. Once again if it's greater than 1.88
18 based on the BDAC, it exceeds their criteria and
19 that's --

20 Q. Right, and their criteria asks you to
21 look at more specific --

22 A. Absolutely it does include that.

23 Q. Okay. That's fine. I think I
24 understand. I asked Mr. -- or Dr. -- sorry --

1 Dr. Anderson some questions about the Florida study
2 of Round Lake and he was not aware of the amounts of
3 radium in lake and groundwater that were pumped into
4 that lake, do you know the answer to that question?

5 A. I don't recall the loading, I do
6 recall the concentrations of sediment and water,
7 groundwater.

8 Q. Okay. Do you recall how often the
9 lake would be completely empty?

10 A. I don't. No, I don't.

11 Q. Would you agree that the amount of
12 loading would have an impact on the sediment levels
13 of radiation?

14 A. Help me to understand your terminology
15 of loading.

16 Q. No, okay. No, I understand, you're
17 right, and I'm not sure I'm using that in a
18 technically scientific way. But if, for example,
19 they needed to add -- I'll use easy numbers -- a
20 hundred gallons in order to keep the level of the
21 lake at the level they were adding it and that
22 hundred gallons was at a concentration of two
23 picoCuries versus if they had to add a million
24 gallons at the same concentration, would you expect

1 to see different levels of radium in the sediment?
2 That's how I'm thinking of loading, does that make
3 sense to you? It's very basic.

4 A. Well, let me try it differently.
5 Okay. What I do know is take the study, take the
6 information.

7 Q. Uh-hum.

8 A. What you had in the groundwater coming
9 in was in the order of a couple picoCuries per
10 liter.

11 Q. Uh-hum. That was my example, two.

12 A. One or two. And the lake water was
13 slightly the same, it wasn't significantly
14 different, one or two or three. But what we saw or
15 what the study showed was that when you look into
16 the aquatic organisms such as the mussels, there was
17 an incredible increase in the concentration, there
18 was a bioaccumulation --

19 Q. Right.

20 A. -- a biofactor phenomena going on and
21 the sediment itself was around 12, 12.2 I think was
22 the average picoCuries per gram, so we're going from
23 one to two in the groundwater, approximately the
24 same two or three in the lake water -- and I have

1 that backwards, excuse me, the other way around and
2 yet we're seeing 12 in the sediment, we see an
3 increase, a significant increase in the tissue of
4 the mussels. That's what the bio dose is trying
5 to -- that's exactly what the DOE model is trying to
6 do, to answer the question.

7 Q. Can you answer the question that I
8 asked?

9 A. I'm trying to explain.

10 Q. Which was -- which was --

11 MR. FORT: I think he's trying to
12 answer your question, he said I can't answer
13 it that way but I can answer it this way,
14 so ...

15 BY MS. WILLIAMS:

16 Q. The question was pretty simple. Would
17 there be a difference in the sediment levels if
18 there was more radium? I mean, I think it's pretty
19 simple.

20 A. Okay. It's simple.

21 Q. And you don't know the answer?

22 A. I think I've answered the question.

23 Q. I'd like to read you something from
24 the module.

1 MR. FORT: Excuse me, counsel, if
2 you -- Mr. Williams thinks that he can answer
3 it, but it's not a simple answer.

4 MS. WILLIAMS: No, I mean I would like
5 the Hearing Officer to ask him to answer
6 unless you feel that he's answered it.

7 HEARING OFFICER ANTONIOLLI: Well, if
8 you feel that you've answered the best that
9 you can, then we can continue on and
10 Mr. Williams can answer your question if you
11 would like him to.

12 MS. WILLIAMS: That's okay, I'd like
13 to stick with Mr. Adams.

14 HEARING OFFICER ANTONIOLLI: Okay.

15 BY MS. WILLIAMS:

16 Q. I would like to read you a sentence
17 from page M1-3, the Module 1 of the Biota Dose
18 Assessment just to see if you would agree with it.

19 A. I'm sorry, M?

20 Q. M1, Page 3. Just Page 3 of the
21 module. Did you find it? I'll read it for you.

22 A. Sure.

23 Q. Nationally and internationally, no
24 standardized methods have been adopted for

1 evaluating doses and demonstrating protection of
2 plants and animals from the effects of ionizing
3 radiation.

4 Do you agree with that statement?

5 A. Well, that's -- that statement is made
6 in light of a need to do that type --

7 Q. To do this --

8 A. -- of that research and that's what
9 this is all about. This is the DOE approach to
10 addressing that.

11 Q. Right, but you testified that this
12 approach just tells you when you need to look
13 further, correct? It doesn't tell you the dose that
14 would cause harm to plants or animals, correct?

15 A. I'm having a difficult time following
16 you in your questioning. What this methodology does
17 is establish criteria, the one rad per day -- the .1
18 rad per day --

19 Q. And that's the dose --

20 A. -- that is consistent with the IAEA,
21 the NCRP, the folks from Canada, the folks from --
22 the folks from Canada or the advisory committee on
23 radiation protection, Canadian Nuclear Safety
24 Commission, the UK Environmental Agency. I mean,

1 it's not just the DOE, it is a group, in my opinion,
2 internationally known and recognized and accepted
3 agencies that have clearly identified a need to look
4 at protection of the environment and exposure to
5 radiation and that's what this methodology is
6 talking about.

7 Q. On, I think it's on that same page,
8 you refer to -- yeah, down -- the last -- well,
9 second to the last paragraph I guess, yeah. You say
10 moreover, new information arising out of sampling
11 and investigations done in Florida including data
12 just published in August of this year.

13 Can you explain for us where the
14 data you're referring to was published this year?

15 A. Sure. It is of the same nature of the
16 2000 data, it was by the same folks, the HSWMR, the
17 Hazardous Substance & Waste Management Research
18 folks exhibit.

19 Q. The exhibit -- Okay.

20 A. Yes.

21 Q. Those folks published it. Where was
22 it published at?

23 A. Under the same type of publishing
24 requirements as the 2000.

1 Q. But I mean this study in 2000 was just
2 a contract study, right, it wasn't published in a
3 scientific publication? Are you saying that later
4 data was published in a peer-reviewed publication?

5 A. It was published in a publication,
6 yes, it was.

7 Q. Which one?

8 A. Peer-reviewed, I'm not ...

9 Q. The reason I'm asking is it's not
10 listed on the author's CV that I could tell so I
11 just want to clarify is there somewhere I can look
12 to that a peer-review journal has looked at this
13 study and published it, I would like to see that
14 that would have some impact I think on the Agency if
15 that has occurred. That's fine, take your time.

16 A. It's 2004 --

17 Q. No, it's 2000 -- according to your
18 testimony, it's this year August of 2004.

19 A. Well, that's part of my testimony.
20 It's part of my attachment or exhibit.

21 Q. So you mean it was published in your
22 testimony? I know that's not what you mean, I'm
23 sorry but I'm confused.

24 A. You asked me about a particular

1 publication, are you referring to the August 2000
2 one?

3 Q. No.

4 A. No.

5 Q. I'm referring to where you say in your
6 testimony that data has been published in August of
7 this year.

8 A. Correct. And my response was there is
9 a similar document, a follow-up publication, similar
10 to the publication that is in my Attachment D --

11 Q. Right.

12 A. -- that is dated August 2004, it's
13 additional information.

14 Q. And it was -- but it wasn't in a
15 peer-reviewed journal, it was just supplementary
16 information?

17 A. When you say peer-reviewed journal,
18 would you consider -- if I may ask -- is this a
19 peer-reviewed journal?

20 Q. According to Dr. Anderson it was -- it
21 is not, no, and I don't think it is.

22 A. Well, maybe the simple answer is I
23 don't know.

24 Q. Okay. Well, I was wondering maybe the

1 answer was that you meant to say August 2002, I
2 guess, maybe that's what you meant and you were just
3 ref- -- I wasn't sure if you were referring to a new
4 publication, if you meant to say August 2000 or if
5 there actually was something new in a new journal.

6 A. It's something new.

7 Q. Okay. I just want you to understand
8 we are trying to look at everything that, you know,
9 maybe other folks have found that we have not found
10 and this is something that you referred to that if
11 we need to look at it, we would like to.

12 A. Sure. And let me check that, how's
13 that?

14 Q. That would be great. It's in your
15 post-written comments, you can address that, that
16 would be great.

17 A. We can do that, that's a better
18 answer.

19 HEARING OFFICER ANTONIOLLI: If you
20 found the citation to the article, are you --

21 THE WITNESS: No, wait a minute. Hang
22 on.

23 HEARING OFFICER ANTONIOLLI: Okay.

24 MS. WILLIAMS: Can I move on? Because

1 I'm happy with you just telling us later.

2 HEARING OFFICER ANTONIOLLI: You can
3 go ahead.

4 MS. WILLIAMS: That's fine with me.

5 HEARING OFFICER ANTONIOLLI: Okay.

6 BY MS. WILLIAMS:

7 Q. On Page 3 of the testimony you start
8 out with a question, are there other sources of
9 radium discharging, and also you attach an Exhibit
10 I, a copy of a permit from the LaSalle station.

11 Are you aware of what source of
12 cooling water the LaSalle station uses?

13 A. The source?

14 Q. Yes.

15 A. I'm not.

16 Q. So you don't know if they use
17 groundwater for cooling there?

18 A. No, I do not.

19 Q. On Page 3 there is a part of your
20 testimony that I found very vague and I understand
21 you're saying that due to confidentiality you cannot
22 tell us the name of the facility that you're
23 referring to and that's fine, but can you at least
24 provide us information on the concentrations?

1 A. Yes.

2 Q. You state that the sludge levels are
3 consistent with predicted sludge levels. Could you
4 at least tell us what they were?

5 A. If you give me the liberty to go back
6 to my August testimony.

7 Q. Oh, you can look at whatever you need
8 to?

9 A. I can show you.

10 HEARING OFFICER ANTONIOLLI: We're
11 putting you on the spot here. Are you ready?

12 THE WITNESS: I've got to help you to
13 find it, it's part of Exhibit C of my former
14 testimony. It's part of the tables that show
15 the biosolid results of the various
16 numbered --

17 BY MS. WILLIAMS:

18 Q. Would you mind if I look off you?

19 A. Those are the tables, samples taken
20 from various POTWs.

21 Q. Okay.

22 A. Not names but numbers --

23 Q. Uh-hum.

24 A. -- for identification.

1 HEARING OFFICER ANTONIOLLI: Can you
2 all speak up for the Board and for the court
3 reporter?

4 BY MS. WILLIAMS:

5 Q. Is one of the numbers representative
6 of the Illinois?

7 A. Yes, 118. One hundred eighteen
8 picoCuries per gram.

9 Q. Okay. Thank you. And was that a
10 measured value then?

11 A. Yes, it was. Measured being
12 analytically derived, calculated.

13 Q. Okay. Can you explain how you
14 calculated that?

15 A. Well, by the lab. The lab took
16 samples of the sludge of the cake actually, sludge
17 cake, it was sent off to one of two laboratories
18 that were selected by the AMSA committee and that
19 sludge was then subject to analytical procedures and
20 118 picoCuries per gram for radium 226 was provided.

21 Q. You have provided an attachment, I
22 believe it's Attachment G regarding your
23 calculations for the city of Joliet; is that
24 correct?

1 A. My review of the calculations --

2 Q. Your review.

3 A. -- that were performed by the IEPA,
4 not my calculations.

5 Q. So is this piece of paper your review
6 or is this piece of paper --

7 MR. FORT: Just for the record,
8 Counsel, so we're not confused, his
9 Attachment G is two pages out of your
10 Exhibit 12 and it's two pages that had the
11 calculation, I think it was called Attachment
12 1, the calculations on the content of the
13 Joliet material.

14 HEARING OFFICER ANTONIOLLI: Are we
15 talking about his last -- the last pre-filed
16 testimony for the August hearing?

17 MR. FORT: No, it's the Agency's
18 Exhibit 12 that they put in.

19 HEARING OFFICER ANTONIOLLI: Okay.

20 MS. WILLIAMS: Right, I understand and
21 you resubmitted it as a new exhibit.

22 MR. FORT: We just took that page so
23 that you could get the page as opposed to
24 everything else that was in that letter. I

1 think that was the IEMA letter.

2 MS. WILLIAMS: I would like to confer
3 to see if I'm done for a second.

4 (Brief pause.)

5 BY MS. WILLIAMS:

6 Q. You know, I did want to ask you one
7 other question that I asked Dr. Anderson. Do you
8 know what the effluent limit is for nuclear power
9 plants?

10 A. Well, that depends -- that's
11 established by the NRC and it would be very specific
12 to the radionuclides that the power plant is
13 discharging.

14 Q. I'm sorry, for radium. Did I say for
15 radium?

16 A. No, you did not.

17 Q. I'm sorry. Thank you. I meant for
18 radium. What would it be for radium?

19 A. Well, radium is a natural occurring
20 radionuclide and there probably would be no reason.

21 Q. No reason to have it?

22 A. Unless there was some special
23 man-enhanced process that would discharge radium.

24 Q. Like using groundwater?

1 A. Well, whatever the source is. It's
2 regulated at a discharge point not from the source.

3 MS. WILLIAMS: I think that's all I
4 have.

5 MR. ETTINGER: I'm sorry, I apologize,
6 could you read that answer back?

7 (Whereupon, the requested
8 portion of the record
9 was read accordingly.)

10 MS. WILLIAMS: I asked that question
11 because someone had told me they thought
12 there was a limit of 60 picoCuries per liter
13 but I don't know if that's true, I thought
14 you know a lot about these things, you might
15 know.

16 THE WITNESS: I don't.

17 MS. WILLIAMS: You don't?

18 THE WITNESS: I don't know what that
19 particular -- that particular license
20 includes, what the standards are. They
21 are --

22 THE COURT REPORTER: I'm sorry, they
23 are what?

24 THE WITNESS: I'm sorry. I don't know

1 what the particular LaSalle license, NRC
2 license is. You have to look into the
3 details and the discharge limits would be
4 specified on that license.

5 MEMBER GIRARD: Could I ask a question
6 then? Could someone introduce this into the
7 record, either the Agency, or ...

8 MS. WILLIAMS: Yeah, we can look into
9 that both if there is a standard for LaSalle
10 and if there is an NRC effluent limit.

11 MEMBER GIRARD: Thank you.

12 MS. WILLIAMS: In fact, we would hope
13 that maybe we can try and get that from the
14 Division of Nuclear Safety at IEMA and they
15 would be the ones that would know that I
16 think, that will be what we'll try and do.

17 MEMBER GIRARD: While I'm asking
18 questions along that line, is it -- we seem
19 to be having some conflicting testimony about
20 the radium standards throughout the United
21 States and various states, and you've
22 presented information on mostly the Region 5
23 states but we've got some information now on
24 Florida. Is it possible for you to go

1 through and give us a spreadsheet on what the
2 standards are in the different states?

3 MS. WILLIAMS: I think that would
4 take -- I think that would take serious
5 research commitment that I'm not sure we
6 could do in the time that we have. I know
7 that we have done a lot more research even
8 since the last hearing expanding on that if
9 you would like testimony from Bob on what he
10 knows more broadly, we can do that here today
11 and see what -- I mean, I just don't know if
12 I can make a commitment for his time because
13 we don't have a spreadsheet like that, we
14 have to create it. We can do our best to
15 create it with what we have.

16 MEMBER GIRARD: Certainly the more
17 testimony to enhance your record would be
18 great but I mean if you've got a spreadsheet,
19 please put it into the record. Thank you.

20 MS. WILLIAMS: I don't think I have
21 any more questions at this point for either
22 witness so I would like to rest if that's
23 okay. I mean, not rest rest but rest my
24 case.

1 HEARING OFFICER ANTONIOLLI: Okay.

2 Let's go off the record for a moment.

3 (Whereupon, a discussion
4 was had off the record.)

5 HEARING OFFICER ANTONIOLLI: It is
6 about ten to 5:00 now and we have this
7 hearing room again tomorrow, we'll be --
8 we'll see each other again back here at
9 9:00 o'clock in the morning unless anyone
10 else -- I'll take any other requests for
11 comments at this point.

12 (No response.)

13 HEARING OFFICER ANTONIOLLI: And
14 seeing no further requests, I'll adjourn the
15 hearing for today and we'll reconvene
16 tomorrow morning. Thank you all for being
17 here.

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1 (Whereupon, the
2 proceedings were
3 continued until 9:00
4 o'clock a.m. on October
5 22nd, 2004 pursuant to
6 agreement.)

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1 STATE OF ILLINOIS)
2) SS.
3 COUNTY OF L A K E)

4 I, MARGARET MAGGIE JANKOWICZ, a notary
5 public within and for the County of Lake and State
6 of Illinois, do hereby certify that heretofore,
7 to-wit, on the 21st day of October, A.D., 2004,
8 personally appeared before me at The Thompson
9 Center, 100 West Randolph Street, Room 02-025, in
10 the City of Chicago, County of Cook and State of
11 Illinois, the transcript of proceedings were called
12 by the Illinois Pollution Control Board in a certain
13 cause now pending and undetermined before the
14 Illinois Pollution Control Board in regards to
15 Revisions to Radium Water Quality Standards:
16 Proposed New 35 Ill. Admin. Code 302.307 and
17 Amendments to 35 Ill. Admin. Code 302.207 and
18 302.525.

19 I further certify that the said
20 witnesses were by me first duly sworn to testify the
21 truth, the whole truth and nothing but the truth in
22 the cause aforesaid; that the testimony then given
23 by them was by me reduced to writing by means of
24 shorthand in the presence of said witnesses and

1 afterwards transcribed upon a computer, and the
2 foregoing is a true and correct transcript of the
3 testimony so given by them as aforesaid.

4 I further certify that the reading
5 and signing of said proceedings will be
6 presented to the Illinois Pollution Control Board
7 for review and deliberations.

8 I further certify that the taking of
9 the proceedings were pursuant to notice to the
10 public, and that there were present at the taking of
11 the proceedings the aforementioned parties.

12 I further certify that I am not
13 counsel for nor in any way related to any of the
14 parties to this suit, nor am I in any way interested
15 in the outcome thereof.

16 In testimony whereof I have hereunto
17 set my hand and affixed my notarial seal this 2nd of
18 November, A.D., 2004.

19

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MARGARET MAGGIE JANKOWICZ, CSR.
Notary Public, Lake County, IL
Illinois License No. 084-004046

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