

1           BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

2                                   April 1, 2004

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IN THE MATTER OF:	)
	)
REVISIONS TO RADIUM WATER	)R04-21
QUALITY STANDARDS: PROPOSED	)Rulemaking - Water
NEW ILL. ADM. CODE 302.307	)
and AMENDMENTS TO 35 ILL. ADM.	)
CODE 302.207 and 302.525	)

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                                  TRANSCRIPT OF PROCEEDINGS held in the  
hearing of the above-entitled matter, taken  
stenographically by Julia A. Bauer, CSR, before Amy  
C. Antonioli, Hearing Officer, at James R. Thompson  
Center, 100 West Randolph Street, Room 8-033,  
Chicago, Illinois, on the 1st of April, A.D., 2004,  
at the hour of 1:30 p.m.

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

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ILLINOIS POLLUTION CONTROL BOARD,

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JAMES R. THOMPSON CENTER

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100 West Randolph Street

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Suite 11-500

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Chicago, Illinois 60601

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(312) 814 - 3956

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BY: MS. AMY C. ANTONIOLLI, Hearing Officer

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MR. NICHOLAS J. MELAS, Board Member

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MR. ANAND RAO, Board Member

11

MS. ALISA LIU, P.E., Board Member

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

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BY: MS. DEBORAH J. WILLIAMS, Assistant Counsel

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ALSO PRESENT: ABDUL KHALIQUE, Metropolitan  
Water Reclamation District of  
Greater Chicago;

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MARGARET MCEVILLY, City of  
Joliet;

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SUSAN HEDMAN, DCEO;

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JERRY KUHN, the Agency  
ROBERT MOSHER, the Agency  
BLAINE KINSLEY, the Agency

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1                   HEARING OFFICER: Good afternoon my  
2 name is Amy Antonioli, and I'm the hearing  
3 officer assigned to this proceeding,  
4 entitled, In The Matter of Revisions to  
5 Radium Water Quality Standards: Proposed New  
6 Illinois Administrative Code 302.207 and  
7 Amendments to 35 Illinois Administrative Code  
8 302.207 and 304.525.

9                   Right now it is about  
10 1:30, and we are going to go off the record  
11 again here in a few minutes and wait for the  
12 Agency attorney to arrive, as well as the  
13 three witnesses who will testify today.

14                   (Whereupon, a discussion  
15 was had off the record.)

16                   HEARING OFFICER: Okay. We're back on  
17 the record, and right now it is 2:06 in the  
18 afternoon. Again, my name is Amy Antonioli,  
19 and I've been appointed hearing officer for  
20 this rulemaking proceeding, entitled -- and  
21 I'm going to change the name -- or read the  
22 caption again into the record to correct it,  
23 because I initially read the caption and it  
24 was wrong. So it's, In the Matter of

1 Revisions to Radium Water Quality Standards  
2 Proposed New Illinois Administrative Code  
3 302.307 and Amendments 235 Illinois  
4 Administrative Code 302.207 and 302.525,  
5 which the Board has docketed as R04-21.

6 In this proceeding, the  
7 Agency is seeking to amend at the Board of  
8 Water Quality Standards, and this rule making  
9 was filed on January 13th, 2004, by the  
10 Illinois Environmental Protection Agency.  
11 Today is the first of two scheduled hearings  
12 in this matter. The second hearing will take  
13 place on May 6th, 2003, starting at 2:30 in  
14 the afternoon in the Board's office in  
15 Springfield.

16 To my right is member,  
17 Nick Melas, the board member assigned to this  
18 matter, and also present from the board today  
19 are two members of our technical unit, Anand  
20 Rao and Alisa Liu.

21 MR. RAO: Good afternoon.

22 HEARING OFFICER: Today's hearing is  
23 governed by the Board's procedural rules for  
24 regulatory proceedings. All information

1           that's relevant and not repetitious or  
2           privileged will be entered into the record.  
3           All witnesses will be sworn and subject to  
4           cross questioning.

5                                 There are three people  
6           who will be testifying on behalf of the  
7           Agency today, Mr. Jerry Kuhn, Mr. Robert  
8           Mosher and Mr. Blaine Kinsley. If the  
9           pre-filed testimony is not lengthy, we'll  
10          have the testimony read into the record; or  
11          if they so wish, they can make a brief  
12          summary of their testimony, and then we can  
13          enter in the pre-filed testimony as an  
14          exhibit.

15                                We'll allow all of the  
16          witnesses to testify first, and then we'll  
17          allow questions to be asked after. When we  
18          get to the questioning period, anyone can ask  
19          a question. If you do ask a question, state  
20          your name and who you represent before you  
21          begin your questions. We will also allow  
22          anyone who wishes to testify the opportunity  
23          to do so at the close of the pre-filed  
24          testimony. And for the court reporter please

1 speak up and try not to speak over each  
2 other, so the transcript is clear. Please  
3 note that any questions asked by Member Melas  
4 or the staff are intended to help build the  
5 complete record for those members of our  
6 staff who can't be here today, and not to  
7 express any preconceived notion or bias.

8 So at the side of the  
9 room I've also brought today current copies  
10 of the current service list and notice list.  
11 There's a copy of the board order accepting  
12 this rulemaking for hearing. There's a copy  
13 of the notice of hearings, the Agency's  
14 statement of reasons and also the pre-filed  
15 testimony. So at this time, Member Melas,  
16 would you like to add anything?

17 MR. MELAS: No. I'm glad that you all  
18 got here safe and sound.

19 HEARING OFFICER: Okay. So at this  
20 point we'll turn it over to the Agency's  
21 attorney, Ms. Deborah Williams, for an  
22 opening statement, if you have any.

23 MS. WILLIAMS: Good afternoon. My  
24 name is Deborah Williams, and I'm an

1           assistant counsel for the Bureau of Water  
2           with Illinois EPA. I am representing the  
3           Agency today in support of its rulemaking  
4           proposal, which was just identified. The  
5           caption was read. I won't read the whole  
6           caption back again by the hearing officer,  
7           but this proposal amends the existing radium  
8           water quality standards.

9                                    On behalf of the  
10          director, I'd like to thank the Board for its  
11          consideration of this rulemaking proposal and  
12          this opportunity to provide testimony and  
13          support thereof. I have with me today, three  
14          experienced staffs from the Bureau of Water  
15          to present their testimony. All three have  
16          submitted pre-file testimony to the Board,  
17          and all parties on the service list prior to  
18          today's hearing and are prepared to read that  
19          testimony into the record, if that's the  
20          hearing officer's preference.

21                                   First, we will hear from  
22          Jerry Kuhn, to my far left, who is the  
23          manager of the permit section in the division  
24          of public water supplies. We'll discuss the

1           impetus of this proposal from the community  
2           water supply perspective. Then we have Bob  
3           Mosher of the standard section in the  
4           division of water pollution control, who will  
5           discuss the history of radium water quality  
6           standards and the technical basis for the  
7           proposed changes, and Bob is to my immediate  
8           left. And in between Bob and Jerry is Blaine  
9           Kinsley, who will also present testimony.  
10          Blaine is with our industrial permit unit and  
11          will discuss effectiveness of the existing  
12          publically owned works treating radium.  
13          Following the testimony of all the witnesses,  
14          we'll be happy to answer any questions from  
15          the board or public. So I'll turn it over to  
16          Jerry now.

17                   HEARING OFFICER: Before you begin,  
18                   we'll have the witnesses sworn in and then  
19                   we'll go ahead with the testimony. Would you  
20                   like to go ahead?

21                   COURT REPORTER: Sure.

22   (Witness sworn.)

23                   HEARING OFFICER: Thank you. You can  
24                   go ahead.



1                   MR. KUHN: My name is Jerry Kuhn. I  
2                   am the manager of Permit Section For the  
3                   Division of Public Water Supplies of the  
4                   Illinois Environmental Protection Agency and  
5                   have held that position since October of  
6                   2000. The permit section is responsible for  
7                   the review of construction permit  
8                   applications by community water supplies. A  
9                   construction permit is required by the  
10                  Illinois EPA for construction of any new  
11                  community water supply and for changes or  
12                  modifications to an existing community water  
13                  supply including water main extensions and  
14                  water treatment plant modifications. I've  
15                  worked for the Illinois EPA for approximately  
16                  21 years, including 11 years in the Division  
17                  of Water Pollution Control Permit Section and  
18                  eight years in the Bureau of Land as the RCRA  
19                  Unit Manager in the Permit Section. Prior to  
20                  my time at the Illinois EPA, I worked for a  
21                  consulting engineering firm.

22                  COURT REPORTER: Excuse me. Can you  
23                  slow down a little bit. I'm so sorry. Just  
24                  a little bit.

1                   MR. KUHN: Okay. I received a  
2 Bachelor of Science in Engineering Degree  
3 from Bradley University in 1975 and a Master  
4 of Science in Thermal and Environmental  
5 Engineering Degree from Southern Illinois  
6 University at Carbondale in 1985. I have  
7 been an Illinois Licensed Professional  
8 Engineer since 1980.

9                   Today I will testify in  
10 regards to the Illinois EPA's proposed  
11 changes to the water quality standards for  
12 radium and the proposal's impact on Illinois  
13 of community water supply systems.  
14 Regulations for radionuclides in drinking  
15 water were first promulgated in 1976 as  
16 interim regulations under the authority of  
17 the Safe Drinking Water Act of 1974. The  
18 standard was proposed for revision upward to  
19 20 picocuries per liter in 1991, but  
20 eventually it was determined that the  
21 original 5 picocuries per liter should remain  
22 the MCL standard. On December 7th, 2000,  
23 U.S. EPA finalized revisions to the 1976  
24 radionuclide regulations, which have since



1 bedrock aquifers.  
2 Community water supplies that exceed the MCL  
3 for radionuclides have three basic options to  
4 lower their radium levels: Blend their water  
5 with a source of water with no or low amounts  
6 of radium to meet the MCL, acquire another  
7 source for their drinking water with radium  
8 below the MCA, or install treatment for their  
9 source water.

10 Under the Safe Drinking  
11 Water Act, U.S. EPA must specify best  
12 available technologies for treatment of each  
13 MCL. In regards to treatment for removal of  
14 radionuclides, U.S. EPA considers ion  
15 exchange, reverse osmosis and lime softening  
16 to be the best available technology.  
17 Additionally, small systems, those serving  
18 less than 10,000 people, compliance  
19 technologies include green sand filtration,  
20 hydrous manganese oxide filtration and  
21 enhanced coagulation filtration. All of  
22 these radionuclide removal technologies  
23 produce residual waste streams that must be  
24 dealt with. Anywhere from 5 to 25 percent of

1           the water obtained from well sources and  
2           treated by one of the radium removal  
3           technologies ends up as a wastewater  
4           containing radionuclides removed from the  
5           source water and discharged to the local  
6           wastewater treatment plant. Depending on the  
7           initial groundwater concentration, removal  
8           efficiency in the wastewater treatment plant  
9           and the dilution available in the receiving  
10          stream, communities with radionuclides in the  
11          source of their drinking water have or will  
12          have, once they implement a radium removal  
13          technology, a problem with violations of the  
14          existing radium water quality standard as it  
15          applies to most -- to most of the water of  
16          the state.

17                                    It is my opinion that the  
18          Agency's proposed changes to the Board's  
19          water quality standards for radium will  
20          assist community water supplies in coming  
21          into compliance with the Safe Drinking Water  
22          Act and prevent their efforts to reduce  
23          radium in drinking water from becoming an  
24          issue of non-compliance with surface water

1           quality standards for publicly owned  
2           treatment works while still protecting  
3           surface water quality.

4                                 Finally, I would like to  
5           thank the Board for the opportunity to submit  
6           this pre-filed testimony and for its  
7           consideration of the Agency's rulemaking  
8           proposal.

9                                 MR. MOSHER: My name is Bob Mosher,  
10          and I have been employed by the Illinois  
11          Environmental Protection Agency for over 18  
12          years with more than 16 years experience in  
13          the Water Quality Standards Unit. I am an  
14          aquatic biologist by training with a  
15          specialization in stream ecology and  
16          laboratory aquatic life toxicity studies.  
17          Most recently I have been involved in the  
18          development of water quality standards for  
19          nutrients, radium and sulfates for eventual  
20          adoption by the Illinois Pollution Control  
21          Board as well as water quality standards  
22          implementation support for the Permit and 401  
23          Water Quality Certification Sections of the  
24          Bureau of Water. I have a Bachelor of

1 Science degree in environmental biology and  
2 zoology from Eastern Illinois University and  
3 a Master of Science degree in zoology also  
4 from Eastern Illinois University. My  
5 pre-filed testimony in this matter will  
6 address the history and backgrounds of the  
7 Board's current radium water quality  
8 standards and the justification for the  
9 Illinois EPA's proposed changes to those  
10 standards.

11 Radium is a naturally  
12 occurring radioactive metal that exists in  
13 several isotopes. Radium forms when two  
14 other radioactive metals, uranium and  
15 thorium, decay. These substances are  
16 naturally found in the rocks and therefore  
17 radium is ubiquitous in the environment.  
18 Radium is usually measured in picocuries per  
19 liter. A picocurie is a very small amount of  
20 radioactivity. One picocurie is associated  
21 with about one trillionth of a gram of  
22 radium. Radium 226 emits alpha radiation and  
23 radium 228 emits beta radiation. The  
24 half-life of radium 226 is 1,600 years while

1           radium 228 has a half-life of 5.7 years.  
2           There are two other natural isotopes of  
3           radium that have half-lives of just a few  
4           days.

5                                 Radium may exist in small  
6           Illinois streams below sewage treatment  
7           plants serving communities that utilize high  
8           radium groundwater as drinking water at  
9           levels exceeding the existing general use  
10          water quality standard of 1 picocurie per  
11          liter. Discharges to larger streams probably  
12          receive sufficient dilution to meet the  
13          standard. Recent stream concentrations  
14          measured in the Fox River were under 1  
15          picocurie per liter. The Fox River flows  
16          through a region where many communities  
17          depend on high radium groundwater,  
18          illustrating that ambient river water is very  
19          low in radium and that the overall effect of  
20          dischargers is minor. The vast majority of  
21          Illinois community water supply facilities  
22          with high concentrations of radionuclides in  
23          their source water, all groundwater, are  
24          located in the northern half of the state and



1           in a region that stretches from Henderson  
2           County in the west to Cook and Lake Counties  
3           in the northeast. Sewage treatment plants  
4           discharges to very small streams where no  
5           dilution water is present have the potential  
6           to contain as much as 5 to 10 picocuries of  
7           radium depending on concentrations in the  
8           groundwater and efficiency of treatment in  
9           removing radium to the sewage sludge.

10                               The existing general use  
11           water quality standard for radium 226 is 1  
12           picocurie per liter and is found in 35  
13           Illinois Administrative Code 302.207. This  
14           standard was adopted by the Board as part of  
15           its initial set of water quality regulations  
16           first promulgated in 1972 in docket R71-14.  
17           An identical standard first appeared in the  
18           regulations for the Lake Michigan Basin in  
19           1997 due to a change in the format of how  
20           Lake Michigan standards were presented. This  
21           standard has been continuously applicable in  
22           Lake Michigan since 1972, however. The  
23           Board's 1972 opinion accompanying adoption of  
24           the radium standard mentioned that the new

1 regulation, quote, retains existing  
2 radioactivity levels, unquote, which implies  
3 that this standard existed prior to 1972 in  
4 the Sanitary Water Board, the precursor to  
5 the Agency and Board regulations. A  
6 justification document that appears to have  
7 accompanied the rulemaking also simply says  
8 that the radioactivity standards, quote,  
9 retain existing radioactivity levels,  
10 unquote. We now have reason to believe that  
11 the Board's 1972 radium 226 standard did not  
12 preserve a then existing state standard but  
13 rather was derived from a federal suggested  
14 value current at that time.

15 The Illinois Sanitary  
16 Water Board had numerous regional water  
17 quality standards in place by 1966 and these  
18 included either a radium 226 standard or an  
19 alpha omitters, which was presumably the  
20 Sanitary Water Board meant alpha emitters  
21 standard depending on the region. This may  
22 have been due to the fact that standards for  
23 interstate waters reflected the neighboring  
24 state's preference, some choosing to regulate



1 federal source called the Public Health  
2 Service Drinking Water Standards published by  
3 the U.S. Department of Health, Education and  
4 Welfare in 1962, and also cited in the  
5 Agency's rulemaking proposal, is implicated.  
6 In the 1962 document, finished drinking water  
7 standards are given: 3 picocuries per liter  
8 for radium 226, 10 picocuries per liter for  
9 strontium 90 and 1,000 picocuries per liter  
10 for gross beta radiation. These are the  
11 exact values adopted by the Sanitary Water  
12 Board for raw water being used as a public  
13 water supply.

14 In a later federal  
15 source, the Green Book, formally referred to  
16 as the Report of the Committee on Water  
17 Quality Criteria, dated April 1st, 1968, and  
18 cited in the Agency's proposal, a table is  
19 given in the section on Public Water Supply  
20 Standards, which gives two values for each  
21 parameter, a, quote, permissible value and a,  
22 quote, desirable value. The permissible  
23 value is 3 picocuries per liter for radium  
24 226, while the desirable value is less than 1

1           picocurie per liter. For strontium 90 these  
2           values are 10 and less than 2 and for gross  
3           beta 1,000 and less than 100 picocuries per  
4           liter, respectively. The Green Book cites  
5           the 1962 Public Health Service document as  
6           the source of its permissible criteria, but  
7           it seems that the desirable criteria are its  
8           own invention. The Green Book specifically  
9           states that these values apply not to  
10          finished water but, quote, can be used in  
11          setting standards for raw water quality only,  
12          unquote, which implies that these were  
13          intended to be point of intake standards.  
14          Taking a finished water standard and applying  
15          it as a raw water standard adds conservatism,  
16          since any treatment provided by the community  
17          water supply would reduce concentrations. It  
18          appears that the Green Book took this liberty  
19          with the 1962 drinking water standards.

20                                The Green Book appears to  
21          be the source for the Pollution Control Board  
22          general use water quality standards of 1972.  
23          The Sanitary Water Board adopted their  
24          standards before publications of the Green

1 Book and interpreted the 1962 Public Health  
2 Service values as point of intake standards  
3 for public water supplies. The Pollution  
4 Control Board apparently changed two things,  
5 making these standards general in  
6 applicability and taking the more stringent  
7 Green Book desirable value as the standard,  
8 simply dropping the less than sign. The  
9 record indicating that the Board said it,  
10 quote, preserve the existing standard,  
11 unquote, may therefore mean that it was the  
12 1968 Green Book desirable recommendation  
13 rather than the standard applicable to  
14 Illinois at that time, adopted by the  
15 Sanitary Water Board, that was being  
16 preserved. It seems certain that the  
17 ultimate origin of the Sanitary Water Board's  
18 radioactivity water quality standards was the  
19 federal Public Health Service documents of  
20 1962, while the Pollution Control Board's  
21 source was the Green Book. For reasons of  
22 concentration, 1 picocurie per liter instead  
23 of 3 picocuries per liter, and applicability,  
24 general use instead of public and food

1 processing water supply, the present radium  
2 standard, and the radioactivity standards in  
3 general, are more conservative than ever  
4 intended by the original source.

5 As explained in Jerry  
6 Kuhn's pre-filed testimony, the current U.S.  
7 Environmental Protection Agency finished  
8 drinking water Maximum Contaminant Level or  
9 MCL for radium 226 plus radium 228 is 5  
10 picocuries per liter. This standard is based  
11 on the fact that radium is a carcinogen.  
12 Persons drinking water over a lifetime will  
13 theoretically be protected from cancer at an  
14 acceptable risk level of ten to the minus  
15 six -- ten -- no, it's ten to the sixth to  
16 ten to the fourth power, if the concentration  
17 of radium in drinking water is less than 5  
18 picocuries per liter. Since the MCL is a  
19 finished drinking water standard, this makes  
20 the previous federal standard of 3 picocuries  
21 per liter applicable at the point of intake,  
22 which applies to raw water, upon which the  
23 Sanitary Water Board standard was based, very  
24 conservative. Protecting nearly all waters

1 at 1 picocurie per liter is excessively  
2 stringent. This level of protection is  
3 undocumented and is unwarranted.

4 Radium is a recognized  
5 carcinogen and therefore standards protecting  
6 sources of drinking water are necessary and  
7 important. However, as far as may be  
8 determined, no other uses of water are known  
9 to be adversely impacted by radium. The  
10 Illinois EPA conducted a literature search  
11 for radium impacts to aquatic life and found  
12 no scientific papers or other information on  
13 this subject. Consultation with USEPA region  
14 five water quality standards staff also found  
15 no indication that radium is anything but a  
16 threat to human health via drinking water.

17 Other states regulate  
18 radium in a similar manner to that proposed  
19 by the Agency. Oklahoma has a standard of 5  
20 picocuries per liter at the point of intake  
21 for public water supplies. The Ohio River  
22 Sanitation Commission has a water quality  
23 standard for the Ohio River of 4 picocuries  
24 per liter applicable everywhere in the river



1 outside of the mixing zones. ORSANCO  
2 considers the entire Ohio River to be a  
3 public water supply. Indiana has an intake  
4 raw water standard of 3 picocuries per liter,  
5 which may be an artifact of the old Green  
6 Book standard. Several other states were  
7 contacted, including California, Utah and  
8 Arizona, western states that have had hard  
9 rock mining issues. Even these states have  
10 no aquatic life water quality standards for  
11 radium. Illinois appears to be unique in  
12 this regard.

13 The Agency's proposal to  
14 remove the general use in Lake Michigan  
15 standards and establish a Public and Food  
16 Processing Water Supply standard at the  
17 federal MCL for radium 226 and 228 is  
18 protective of all uses that may be impacted  
19 by radium. Radium would then be regulated in  
20 a manner similar to other substances that may  
21 cause problems in drinking water yet do not  
22 have to be regulated as stringently for other  
23 uses. These substances are those listed  
24 under 35 Illinois Administrative Code

1 302.304. For example, chloride is regulated  
2 at 250 milligrams per liter under 302.204 to  
3 protect drinking water intakes from excess  
4 salts. There is no reason to regulate  
5 general use waters at this low level since  
6 all other uses of waters are protected at  
7 higher chloride concentrations. The existing  
8 general use standard regulates radium  
9 unnecessarily and causes compliance issues at  
10 communities struggling with drinking water  
11 problems.

12 While there is no data  
13 for radium to indicate what the threshold  
14 concentration would be to protect aquatic  
15 life, the Illinois EPA is confident that it  
16 is much higher than the 5 picocuries per  
17 liter level given the lack of concern for  
18 this exposure route by the scientific  
19 community, the extremely low mass per volume  
20 concentration that this standard represents  
21 and the fact that barium, a much more common  
22 metal related chemically to radium, is not  
23 toxic to aquatic life at the low part per  
24 million level. Presently, the known source

1 of the radium to the surface water  
2 environment are public water supplies that  
3 utilize high radium groundwater. These are  
4 typically no higher in concentration than the  
5 groundwater, and as explained in Blaine  
6 Kinsley's pre-filed testimony to follow,  
7 usually somewhat lower. Even direct  
8 discharges of wastewater resulting from  
9 treatment of high radium groundwater, should  
10 these ever occur, constitute only about  
11 double the radium loading expected from a  
12 sewage treatment plant. Other types of  
13 discharges are unknown. Should a new source  
14 of radium be proposed, the antidegradation  
15 standard would be imposed to require the new  
16 source to justify the radium discharge, which  
17 would include studies of treatment  
18 alternatives and steps to minimize any  
19 necessary radium discharges.

20 It is apparent from our  
21 investigation into the scientific information  
22 and the lack of concern in other states and  
23 at the federal level that drinking water  
24 protection is the only beneficial use

1 classification of Illinois streams and lakes  
2 that warrants a radium water quality  
3 standard. This conclusion is based on  
4 concentrations existing or expected to be  
5 realized in Illinois surface waters from  
6 either naturally occurring conditions or  
7 those resulting from water treatment plant  
8 wastes or their affiliated publicly owned  
9 treatment works in those parts of the state  
10 that rely on radium-containing groundwater as  
11 their portable raw water source.

12 The proposed changes to  
13 the general use and Lake Michigan Basin water  
14 quality standards removes the radium standard  
15 and replaces it with a standard that protects  
16 surface water intakes for raw drinking water  
17 at the established finished drinking water  
18 MCL standard. This change is protective of  
19 the sensitive designated use of Illinois  
20 waters to radium and provides a framework in  
21 the regulations for a sensible approach to  
22 radium in surface waters. Radium will now be  
23 regulated as a combination of radium 226 and  
24 228 at Public and Food Processing Water

1           Supply intakes at a concentration of 5  
2           picocuries per liter.

3                               I would like to thank the  
4           Board for the opportunity to submit this  
5           pre-filed testimony and for its consideration  
6           of the Agency's rulemaking proposal. I will  
7           be pleased to answer any addition questions  
8           presented by the Board or members of the  
9           public regarding the Agency's rulemaking  
10          proposal.

11                           HEARING OFFICER: Thank you, Mr.  
12          Mosher.

13                           MS. WILLIAMS: At this time the Agency  
14          does have a couple exhibits for the Board  
15          that illustrates some of the items presented  
16          in Mr. Mosher and Mr. Kuhn's testimony. I'm  
17          not sure if given this rule -- that it's the  
18          rulemaking proceeding you're concerned about  
19          authenticating the exhibits, but we have two  
20          maps that I can --

21                           HEARING OFFICER: Sure you can go  
22          ahead and make a motion and then --

23                           MS. WILLIAMS: Okay. First I have a  
24          map of the state that I've identified as

1 Exhibit 1.

2 HEARING OFFICER: Sure.

3 MS. WILLIAMS: Jerry, why don't you  
4 identify it. Can you tell us what it is?

5 MR. KUHN: Okay. It's the location of  
6 all the public water supply -- actually,  
7 community water supply surface intakes in the  
8 state of Illinois.

9 HEARING OFFICER: Okay.

10 MS. WILLIAMS: And if there is no  
11 objection if I could have that admitted as  
12 Exhibit 1?

13 HEARING OFFICER: Okay. Seeing no  
14 objections, we'll admit this public water  
15 supply intakes map as Exhibit 1.

16 MS. WILLIAMS: Okay. And I have a  
17 second map. Maybe, Jerry, I'll ask for you  
18 to identify the second map for us also.

19 MR. KUHN: Okay. These are the  
20 locations of, I believe, the majority of the  
21 radionuclide communities service. The  
22 communities that do have a radionuclide  
23 detection over the MCL and their source  
24 water.

1 HEARING OFFICER: Okay.

2 MS. WILLIAMS: And I've marked this  
3 second map as Exhibit 2.

4 HEARING OFFICER: Okay. If there are  
5 no objections, I'll go ahead and admit this.  
6 This additional map of a radionuclide MCL  
7 violations for Illinois community water  
8 supply facilities as Exhibit 2.

9 MS. WILLIAMS: And if there are no  
10 objections, I'd like to move to have it  
11 entered.

12 HEARING OFFICER: And -- sorry, and  
13 we'll enter it as Exhibit 2, if I haven't  
14 done that already.

15 HEARING OFFICER: Mr. Kinsley, you can  
16 go ahead, and if you prefer you can read your  
17 pre-filed testimony into the record or just a  
18 summary. It's your choice.

19 MR. KINSLEY: It's not very long.  
20 I'll just go ahead and read it.

21 HEARING OFFICER: Okay.

22 MR. KINSLEY: Good afternoon. My name  
23 is Blaine Kinsley. I am the manager of the  
24 Industrial Unit in the Division of Water,

1           Pollution Control Permit Section. I have  
2           been in that position since December of 2002.  
3           The Industrial Unit is responsible for  
4           application review and issuance of National  
5           Pollutant Discharge Elimination System, also  
6           referred to as NPDES, permits and state  
7           construction permits for industrial  
8           facilities including backwash discharges from  
9           public water supply facilities. I have  
10          worked for the Illinois Environmental  
11          Protection Agency, Illinois EPA, for nine  
12          years, all of which have been spent in the  
13          industrial unit. Before coming to the  
14          Illinois EPA, I worked for a consulting  
15          engineering firm in Louisville, Kentucky. I  
16          received a Bachelor of Science degree in  
17          Geological Engineering from the University of  
18          Missouri-Rolla in 1994. I have been an  
19          Illinois Licensed Professional Engineer since  
20          2001.

21   My testimony today will  
22          focus on the fate of radium and publicly  
23          owned treatment works, which I will refer to  
24          as POTWs. The specific concerns I will





1 processes. Removal efficiencies, based on  
2 influent versus effluent concentrations,  
3 ranged from a low 29 percent to a high of 97  
4 percent.

5 For the purpose of this  
6 comparison and to address the lack of  
7 existing treatment efficiency or effluent  
8 data, the Agency used the fate of barium in a  
9 POTW to estimate the removal efficiencies for  
10 radium by the same wastewater treatment  
11 facilities. Both radium and barium are Group  
12 IIA metals on the Periodic Table of Elements,  
13 which means they have similar chemical  
14 properties. Influent and effluent sampling  
15 data for barium does exist for some POTWs in  
16 Illinois especially those with approved  
17 pretreatment programs. The influent  
18 concentrations of barium at a sampling of  
19 these POTWs were well below the anticipated  
20 concentrations of radium. Removal  
21 efficiencies, based on influent versus  
22 effluent sampling, ranged from 25 percent to  
23 62 percent. Four of the five POTWs reviewed  
24 utilized activated sludge and one use

1           trickling filters. There did not appear to  
2           be a correlation between the types of  
3           treatment and the removal efficiencies based  
4           on the limited number of facilities where the  
5           data was available.

6                           The Illinois EPA is in  
7           the process of requiring radium sampling of  
8           sludge at POTWs where high levels of radium  
9           are found in the community's source water.  
10          In addition, new state construction permits  
11          for the discharge of radium backwashes to  
12          POTWs require influent and effluent sampling  
13          at the affected POTW. This requirement is  
14          necessary to ascertain the percent removal of  
15          radium in the treatment processes and to gage  
16          the number of facilities that may have  
17          problems meeting the 1 picocurie per liter  
18          water quality standard for radium 226. To  
19          date, the Illinois EPA has received only a  
20          limited number -- limited data from this type  
21          of sampling. Based on the data submitted by  
22          one discharger with two wastewater treatment  
23          plants, the radium removal efficiencies are  
24          between 31 percent and 60 percent. Both of

1           these wastewater treatment plants employ an  
2           activated sludge treatment process. The  
3           difference between the two plants is that the  
4           plant with a 60 percent removal efficiency  
5           receives much more of its influent from  
6           combined sewer flows. The combined sewer  
7           flows would act to dilute the radium  
8           concentration coming to the plant which would  
9           increase its apparent removal efficiency.

10                           Considering typical raw  
11           water concentrations and expected removal  
12           efficiencies, it is anticipated that many  
13           POTWs discharging to streams with little or  
14           no continuous flow may have trouble meeting  
15           the existing radium water quality standard.  
16           The changes proposed by the Agency would  
17           assist these communities in remaining in  
18           compliance with water quality standards while  
19           still protecting all existing and future uses  
20           of the state's lakes and streams.

21                           Finally, I would like to  
22           thank the Board for the opportunity to submit  
23           this pre-filed testimony and for its  
24           consideration of the Agency's rulemaking



1 you mentioned that there -- you list that three  
2 basic options are available for community water  
3 supplies in compliance with the same drinking water  
4 act radium standards. At this time, does the Agency  
5 have any information as to how many of this,  
6 approximately 100 or so, community water supplies  
7 that have opted to treat their source water instead  
8 of blending or...

9 BY MR. KUHN:

10 A. The vast majority of the plans I'm  
11 looking at are -- are -- they're treating their  
12 source water. Some are hooking onto a system that  
13 doesn't have a radium problem. We've had some that  
14 are blending their water with -- the radium is a --  
15 is a deep well phenomena, and we had some that are  
16 drilling shallow wells and then blending the shallow  
17 with the deep well to meet the MCL; but I'd say,  
18 vast majority are providing some type of treatment.

19 Q. And but -- the community water  
20 supplies opting for -- opting to treat their source  
21 water. Do you know if most of them are disposing of  
22 their, you know, waste that's generated by treatment  
23 to their local, publicly owned treatment works, or  
24 did they have other means to dispose it of?

1           A.       All of the one's -- they all generate  
2 a wastewater, so, yes, they would be disposing of  
3 that into the -- in the sanitary source or to the  
4 local POTW.

5           Q.       One of the things that was mentioned,  
6 I think, it was in Mr. Mosher's testimony, it was  
7 that a scenario that was presented where they may  
8 have non-compliance problems would be in a situation  
9 where the POTW is discharging into small stream with  
10 no dilution. Does the Agency have any information  
11 as to number of these affected treatment plants  
12 which are discharging to low-flow streams?

13 BY MR. MOSHER

14           A.       It would be the majority of those  
15 communities to low-flow or zero-flow streams.

16 BY MR. RAO:

17           Q.       When you say majority of those  
18 communities, if we look at this map, which is marked  
19 as Exhibit 2, are you saying that most of these  
20 facilities are discharging to low-flow streams?

21           A.       Yes, that's generally true across the  
22 state; and there's nothing in this group of  
23 communities that's any different.

24           Q.       Right.

1           A.       Just glancing through there, you know,  
2 a few of these are located on -- on larger rivers,  
3 but, you know, most of them are small towns; and  
4 most small towns are located on small streams and  
5 that's where they discharge.

6           Q.       I know. Prior to the Board's option  
7 and the Agency's implementation of this radium MCL,  
8 did the Agency, in the past, encounter any  
9 compliance issues with the existing radium water  
10 quality standard?

11          A.       Well, the fact of that matter is we  
12 have not attempted to regulate that for that  
13 standard. It's assumed that any of these sewage  
14 treatment plants affected in these communities would  
15 not -- would cause the radium standard that exists  
16 now not to be met in those small streams, but the  
17 Agency has not attempted to regulate, knowing that  
18 there is no alternative, no reasonable alternative.

19          Q.       Do you believe that, you know, removal  
20 of radium in drinking water could still become a  
21 non-compliant issue if the current water quality  
22 standard was taken from 1 picocurie per liter to 5  
23 picocuries per liter for combined radium?

24          A.       Well, I think we try to illustrate



1 that the groundwater itself ranges up to 20  
2 picocuries per liter, and if you are pumping that  
3 kind of water out of the ground, removing it from  
4 the drinking water, but then putting -- putting the  
5 radium back in the sewer system so it gets to the  
6 sewage plant anyway. So there's no -- there's no  
7 real change here between a town that is treating for  
8 radium in its drinking water and a town that has not  
9 yet. It all gets back to the sewage treatment  
10 plant. And then if sewage treatment plant removes  
11 at the efficiencies that Blaine has researched --

12 HEARING OFFICER: Thirty-one to 60  
13 percent?

14 MR. MOSHER: Yeah.

15 MR. KINSLEY: Yeah, based on the  
16 barium data.

17 HEARING OFFICER: Okay.

18 BY MR. MOSHER:

19 A. So given all that, there's a potential  
20 in these zero-flow streams that are dominated by the  
21 sewage plant effluent for something, like, you know,  
22 15 picocuries per liter on down. So if we change  
23 the general standard to 5 picocuries, we would still  
24 probably have several communities that would not

1 meet that standard and would have no good  
2 alternative to meet that standard.

3 HEARING OFFICER: And you mentioned  
4 that there -- in some of the pre-filed  
5 testimony, you mentioned that some states do  
6 what this proposal proposes to do. Are there  
7 some states that also have a general used  
8 water quality standard for radium that is  
9 greater --

10 MR. MOSHER: No.

11 HEARING OFFICER: -- such as, similar  
12 to 5.

13 MR. MOSHER: No. I think I mentioned  
14 in my testimony in that where Illinois is  
15 unique in that regard.

16 HEARING OFFICER: Okay.

17 MR. MOSHER: As far as we -- now, we  
18 did not interview every state.

19 HEARING OFFICER: Mm-hmm.

20 MR. MOSHER: We interviewed our  
21 neighboring states in the Midwest, and then I  
22 specifically looked at western states where  
23 uranium mining occurs and things like that  
24 where you would expect more radium, and none

1 of them are setup either.

2 HEARING OFFICER: Okay.

3 MR. MOSHER: So everyone else that we  
4 know of is regulating at the public supply  
5 intake point.

6 BY MR. RAO:

7 Q. Just for clarification purpose, what  
8 you're saying is, basically the load on the publicly  
9 owned treatment work, the radium load won't change  
10 because of the drinking water treatment plant is  
11 removing radium out of the source water because it's  
12 finally going to end up in the treatment plant  
13 anyways?

14 BY MR. MOSHER:

15 A. That's correct. The only way it's  
16 going to change is if that community abandons that  
17 deep well as their source. And, Jerry, I think you  
18 just said that not many are really doing that.

19 MR. KUHN: The vast majority, right,  
20 are choosing to treat.

21 BY MR. RAO:

22 Q. Now, I have a couple of questions to  
23 deal with in the implementation of the Public and  
24 Food Processing Water Supply Standards now since we

1 are moving this radium standard from the general use  
2 to the Public and Food Processing Water Supply  
3 Standards. Can you explain how those rules are  
4 implemented? You know, when going over your  
5 testimony and looking at the rules, it seems like it  
6 applies at the point of intake. So if at the point  
7 of intake the levels are higher than 5 picocuries  
8 per liter, you know, will the public water supply be  
9 responsible to treat it? I just wanted to get that  
10 clear and how we implement that standard.

11 BY MR. MOSHER:

12 A. Well, those standards are protected by  
13 Agency regulatory policies. We would not let a  
14 radium discharger discharge radium into a water that  
15 has a public water supply intake point downstream.

16 HEARING OFFICER: Okay.

17 BY MR. MOSHER:

18 A. We would make sure there would be no  
19 mixing zone at that point of intake, of course,  
20 that's in the mixing zone standards. We -- we  
21 cannot let a mixing zone do that. And the -- the --  
22 really the fact of the matter is there is no known  
23 case where that would occur.

24 BY MR. RAO:

1 Q. So there's no discharger anywhere  
2 near --

3 A. No. And, again, it's a matter of  
4 geology, I guess, that dictates that the -- if you  
5 compare these two maps that we passed out, there's a  
6 large blank area in Northern Illinois where there  
7 are few, if any --

8 Q. Intakes.

9 A. -- surface water intakes. Well,  
10 that's because groundwater is abundant. Groundwater  
11 is cheaper to produce into public water supply,  
12 and -- and the opposite is true for the rest of the  
13 of state that a lot of people are using surface  
14 water. So there are few, if any, discharges of  
15 radium in -- you know, in the area where people are  
16 using surface water, so that works out.

17 MS. WILLIAMS: And maybe, Jerry, could  
18 you explain a little bit for the Board what  
19 the -- what you looked into as far as intakes  
20 and tested for radioactivity.

21 MR. KUHN: Okay. As part of our --  
22 the public water supply requirements, we  
23 require surface water intake -- or not the  
24 intakes, but surface water plant is also

1           sample for radionuclides, and I took a look  
2           at some of the data. Now, the sampling is  
3           done at entry point, which is in the entry  
4           point into the system and not at the route of  
5           water source, but I looked at all the -- the  
6           sampling results, and we didn't have anybody  
7           that had any problems that would -- that  
8           would have a problem with meeting the MCL.

9                       HEARING OFFICER: Okay.

10                      MR. KUHN: So the treatment that they  
11                      provided in the surface water plants would  
12                      meet the standard.

13 BY MR. RAO:

14           Q.        I have one more question. Mr. Mosher,  
15           in your testimony dealing with the history of the  
16           Board's radioactivity standards, you, kind of,  
17           concluded that, you know, the level of protection  
18           that was adopted by the Board was undocumented and  
19           unwarranted in case of radium. Do you believe that  
20           the same rationale holds for strontium 90 and gross  
21           beta?

22 BY MR. MOSHER:

23           A.        Yes, but the same factors are present  
24           with those other two substances. We are not

1 proposing that we change those because there is no  
2 economic or compliance reason to do so. And if we  
3 did propose to change those, we would have had to do  
4 triple the research that we did for radium; and  
5 given our staff situation and resources right now,  
6 we said there's no reason, there's no economic or  
7 social reason that we need to change those so we  
8 won't change those. We'll conserve our resources.

9 Q. Okay. I'm done.

10 BY HEARING OFFICER:

11 Q. One more question for Mr. Kinsley. As  
12 you just mentioned that the EPA requires radium  
13 sampling of sludge at POTWs where high levels are  
14 found in the community's water source, and also that  
15 new state construction permits for discharge of  
16 radium backwashes the POTWs require influent and  
17 effluent sampling. Are those requirements new or  
18 included in permits, or how -- what are those  
19 requirements exactly.

20 BY MR. KINSLEY:

21 A. I believe, you're referring to me.

22 Q. Okay.

23 A. Those are written into state  
24 construction permits currently that basically a

1 state construction permit is required when a POTW  
2 wants to hook onto the -- or let me backup.

3                   When a public water supply  
4 needs to hook onto the POTW and we would consider  
5 that a new source of wastewater to that POTWs, that  
6 backwash discharge. So that when we -- when we  
7 write those permits and we're still trying to get a  
8 hold -- a handle on, since we don't have that much  
9 data yet, what the expected removal efficiencies of  
10 those POTWs are, and that's the reason that we've  
11 been requiring the influent and effluent sampling  
12 when those permits are written. So that we can --  
13 then we know exactly what the removal efficiencies  
14 are, what -- how much of the radium is being  
15 retained in the sludge for those particular POTW and  
16 how much are expected to be discharged. Does that  
17 answer your question?

18           Q.       Yes, it does.

19           A.       Okay.

20 BY MR. RAO:

21           Q.       Just for follow-up to that. So, would  
22 construction permits be required of all of these  
23 POTWs, which will accept this radium backwashes?

24 BY MR. KINSLEY:



1           A.       Primarily, yes, because normally  
2 what's been the case, is that the POTW may -- or I'm  
3 sorry. I keep getting the terms confused. The  
4 water treatment plant may have sand filters or some  
5 type of filtration, but the rating removal requires  
6 more treatment, which -- which results in another  
7 backwash discharge, say, for an example, of ion  
8 exchange or the reject from an RO unit.

9           Q.       Okay.

10          A.       So any time there's a new source like  
11 that, it requires a construction permit from the  
12 state to hook onto that POTW.

13          Q.       There's also a new source of waste to  
14 the POTW, does that also require any kind of NPDS  
15 permit modification or...

16          A.       Normally those POTWs are -- are  
17 designed to a certain capacity, a design average  
18 flow. And until they're -- when they're first  
19 brought on-line, they're much below that design  
20 capacity, and as connection permits -- construction  
21 permits are written to that POTW, there's no need to  
22 normally go back and re-rate those plants or to do  
23 any special monitoring. But in this case, with the  
24 radium, we just wanted to get a handle on what the

1 removal efficiencies are since that really wasn't  
2 tracked in the past.

3 Q. Okay. Because one of the things I  
4 think maybe it was in Mr. Mosher's testimony was  
5 that if there's a new radium discharge, there would  
6 be an antidegradation analysis; but in this kind of  
7 a situation that you are describing, there won't be  
8 an antidegradation analysis required for all of  
9 these treatment plants?

10 BY MR. MOSHER:

11 A. No, because they're already supplying  
12 the radium to the sewage treatment plants. It's not  
13 a new loading source.

14 Q. Thank you.

15 BY MS. LIU:

16 Q. Just out of curiosity, just one more  
17 question. You mentioned that water from radium that  
18 will be removed in the treatment process would end  
19 up in sludge. Are the radium levels high enough in  
20 the sludge to require special disposal of the  
21 sludge?

22 BY MR. KINSLEY:

23 A. We have a memorandum of understanding  
24 with the -- used to be the Illinois Department of

1 Nuclear Safety, but now they've been under the  
2 umbrella of the Illinois Emergency Management, but  
3 it's the same folks, and we've been discussing the  
4 terms of the agreement and seeing if we need to  
5 revise that. And so far, as far as I know, we  
6 haven't -- there's nothing that's come up that we  
7 have revise that -- that agreement. Keep in mind  
8 that the radium in these source waters was always  
9 going to these POTWs, and that, you know, now it's  
10 just being taken out of -- out of the drinking water  
11 side, but it's still going right back in, as it  
12 always did, to the wastewater treatment center. So  
13 we're looking at that, and we're under -- currently  
14 deciding if we need to change those understandings,  
15 so, and that ties into why we're requesting that  
16 data.

17 HEARING OFFICER: Okay. Thank you.

18 Are there any other questions? (Nodding).

19 Okay. Julie, can we go off the record for a  
20 minute?

21 COURT REPORTER: Sure.

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

24 HEARING OFFICER: The Board has a

1 second hearing scheduled for May 6th, 2004,  
2 as I mentioned before, in Springfield, and  
3 the hearing is at 2:30 p.m. in the Illinois  
4 Pollution Control Board hearing room at 1021  
5 North Grand Avenue East. People who would  
6 like to testify at the next hearing should  
7 pre-file the testimony by Thursday, April  
8 22nd. We expect to have the transcript of  
9 today's hearing in our Chicago office by  
10 about 10 days from today, which brings us to  
11 April 10th or 11th. Soon after we receive  
12 it, the Board will post the transcript on our  
13 website, and the website address is  
14 [www.ipcb.state.il.us](http://www.ipcb.state.il.us), bear the transcript as  
15 well as the Agency's proposal and all of the  
16 Board orders throughout this proceeding as  
17 well as the pre-filed testimony will be  
18 viewable and downloadable at no charge.  
19 Alternatively, you can order a copy of the  
20 transcript from the clerk of the Board at  
21 \$0.75 per page. Anyone can file a public  
22 comment in this proceeding with the clerk of  
23 the Board, but please note that when filing a  
24 public comment, you must serve all of the

1 people on the service list with the copy of  
2 the public comment; and, again, copies of the  
3 current service list are available today at  
4 the side of the room or you can contact me or  
5 Lynn Hughes, who is our secretary and you can  
6 reach her -- do you have Lynn's phone number?

7 MR. MELAS: Yeah, 814-3624.

8 HEARING OFFICER: At 814-3624. If  
9 there's nothing further, I wish to thank all  
10 of you for your comments and your testimony.  
11 This discussion will continue at the next  
12 hearing, and today this hearing is adjourned.  
13 Thank you.

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1 STATE OF ILLINOIS )  
 ) SS.  
2 COUNTY OF WILL )

3

4 I, JULIA A. BAUER, CSR, do hereby state  
5 that I am a court reporter doing business in the  
6 City of Chicago, County of Will, and State of  
7 Illinois; that I reported by means of machine  
8 shorthand the proceedings held in the foregoing  
9 cause, and that the foregoing is a true and correct  
10 transcript of my shorthand notes so taken as  
11 aforesaid.

12

13

14

\_\_\_\_\_  
Julia A. Bauer, CSR  
Notary Public,  
Will County, Illinois

15

16

17

18 SUBSCRIBED AND SWORN TO  
19 before me this \_\_\_\_\_ day  
of \_\_\_\_\_, A.D., 2004.

20

\_\_\_\_\_  
Notary Public

21

22

23

24

