BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
REVISIONS TO RADIUM WATER QUALITY	)	R 04-21
STANDARDS: PROPOSED NEW 35 ILL. ADM	)	(Rulemaking –Water)
CODE 302.307 AND AMENDMENTS TO	)	
35 ILL. ADM. CODE 302.207 and 302.525	)	

NOTICE

PC#33

TO: Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph Street, Suite 11-500
Chicago, Illinois 60601

SEE ATTACHED SERVICE LIST

PLEASE TAKE NOTICE that I have filed with the Office of the Pollution Control Board the POST-HEARING COMMENTS OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY on behalf of the Illinois Environmental Protection Agency, a copy of which is herewith served upon you.

Date: December 8, 2004

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Deborah J. Williams

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

REVISIONS TO RADIUM WATER QUALITY STANDARDS: PROPOSED NEW 35 ILL.ADM.CODE 302.307 AND AMENDMENTS TO 35 ILL.ADM. CODE 302.207 AND 302.525	)	R04-021 Rulemaking – Water

POST-HEARING COMMENTS OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

NOW COMES the ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ("Illinois EPA" or "Agency"), by and through one of its attorneys, Deborah J. Williams, and hereby respectfully submits to the Illinois Pollution Control Board ("Board") its Post-Hearing Comments in the above-captioned regulatory proceeding. In support thereof, the Illinois EPA states as follows:

PROCEDURAL HISTORY AND BACKGROUND ON THE ILLINOIS EPA'S PROPOSAL

Under Section 303(c) of the Clean Water Act, the Illinois EPA has the obligation to no less than every three years conduct reviews of its water quality standards and update those standards where needed. 33 U.S.C. 1313(c). As part of that process, the Agency filed a proposal to update the Water Quality Standards for Radium on January 13, 2004.

The current General Use water quality standard for radium 226 (contained in 35 Ill. Adm. Code 302.207) is 1 picocurie per liter ("pCi/L") and was adopted by the Board in the initial set of Board regulations in 1972. *See*, R71-14. An identical standard appeared in the regulations for the Lake Michigan Basin in 1997 due to a change in the

format of how Lake Michigan standards were presented. 35 Ill. Adm. Code 305.525. This standard has been continuously applicable in Lake Michigan since 1972, however. There is no existing standard for radium 228. As a result of the process of requiring community water supplies in the northern Illinois "radium belt" to come into compliance with the federal Maximum Contaminant Level ("MCL") for radium of 5 pCi/L radium 226 and radium 228 combined, the Illinois EPA began to investigate the history of its long overlooked radium General Use water quality standard.

Regulatory history research by the Illinois EPA concluded that the entire basis for the existing standard was faulty and without merit in science, fact or policy. *See,* Statement of Reasons at 3-6, Transcript ("Tr.") of April 1, 2004 hearing at 17-23. No evidence has been presented in this proceeding to conflict with this initial conclusion. Review of the historical basis for the 1 pCi/L radium 226 standard reveals that the Board was attempting to set a water quality standard that was consistent with the then existing Sanitary Water Board regulations. The Board claimed to be basing its 1 pCi/L radium 226 standard on the existing Sanitary Water Board standard. Had the Board correctly done so, it would have done two things differently. First, it would have set the standard at the number used by the Sanitary Water Board of 3 pCi/L radium 226. This 3 pCi/L figure was based on the science available at the time that indicated that a level of 3 pCi/L would ensure protection of human health from consumption of drinking water. Second, had the Board correctly adopted the existing Sanitary Water Board standard it would have made the standard applicable only at public water supply intakes rather than all surface waters of the State. None of the parties to this proceeding have disputed that the existing General Use Water Quality standard for radium was simply a mistake.

Since the adoption of the Board's initial water quality standards regulations and the predecessor Sanitary Water Board regulations, U.S. EPA has concluded that 5 pCi/L is the appropriate standard protective of the human consumption use. Tr. of April 1, 2004 Hearing at 10-17. Therefore, in its regulatory proposal the Illinois EPA proposed adding a combined radium 226 and 228 water quality standard of 5 pCi/L to the Board's Public and Food Processing Water Supply standards, found in Subpart C of Subtitle C of the Board's Water Quality Standards Regulations. *See*, 35 Ill. Adm. Code 302.301-302.306. The Board's Public and Food Processing Water Supply standards are cumulative with the Board's General Use water quality standards and apply "at any point at which water is withdrawn for treatment and distribution as potable supply or for food processing." 35 Ill. Adm. Code 302.301. As presented in the Agency's proposal and the Board's First Notice, the new standard would be placed in Section 302.307 of Subpart C of Part 302.

Following the first two hearings, it became clear that the second component of the Agency's proposal would understandably prove more controversial. In addition to adding the new standard to Subchapter C, the Illinois EPA has also proposed to repeal the current General Use standard in Section 302.207 of Subpart B and the Lake Michigan Basin standard in Section 302.525 of Subpart E.[1] The basis for the second component of the Illinois EPA proposal was a review of existing scientific literature and U.S. EPA guidance which reached the conclusion that no reliable scientific data is available on which to form a conclusion regarding an appropriate water quality standard to protect the aquatic life use. U.S. EPA has developed no water quality criteria document on radium

[1]There is no evidence in the Record of any controversy specifically regarding the repeal of the Lake Michigan Basin radium water quality standard. There are several reasons for this. First, Lake Michigan is a drinking water supply and will therefore be subject to the 5 pCi/L water quality standard in the Illinois EPA's proposal. There is also no factual evidence of expected discharges of radium to Lake Michigan.

and does not mandate states to regulate radium in water not being used as a public water supply. In addition, no party to this proceeding has been able to dispute the Illinois EPA's initial conclusion presented to the Board in its proposal that no controlled, experimental studies of the type mandated by U.S. EPA's guidance on establishing water quality standards is currently available for radium. The Illinois EPA does agree with several commenters that there is some level at which radium in surface waters might be harmful to aquatic life, but has been unable to provide the Board with the scientific basis on which to place that number. Clearly the consensus of the radiation science community has always been that protection of humans will protect the environment. The Illinois EPA is still convinced, after review of additional information provided by WRT, that the levels of radium harmful to the most sensitive species of aquatic life would be higher than levels expected to be found in the environment.[2]

A total of four hearings over five different days have been held on this matter. The Board issued a First Notice Opinion on July 8, 2004 following the first two hearings and the proposed rule was published for First Notice in the Illinois Register on August 6, 2004. Following a request by WRT, the Board granted an additional merit hearing in this matter during the first notice period. When the time allotted for a third hearing did not allow sufficient time for the completion of questioning of WRT's witnesses, a fourth hearing was scheduled and held. The Agency also submitted answers to pre-filed questions of the Environmental Law and Policy Center at the August 25, 2004 hearing. *See*, Exhibit 12.

[2]One example of the uniqueness of pointing to a safe level of radium compared to other parameters regulated by the Board is seen in the consensus reached by the participants in this proceeding that the most sensitive species is not a mussel or caddis fly but a riparian mammal who would be exposed to the largest dose of radium based on bioaccumulation and lifespan.

ADDITIONAL STUDIES AND TECHNICAL SUBMITTALS BY WRT

The Illinois EPA would like to briefly review and summarize for the Board the additional technical information submitted by WRT. This review will focus on studies and other tools brought to the Board's attention during the third and fourth hearings in this regulatory proceeding.

National Council on Radiation Protection Study

At the August 25, 2004 hearing in this matter, WRT pointed the Board's attention to a study by a well respected radiation group entitled Effects of Ionizing Radiation on Aquatic Organisms, National Council on Radiation Protection and Measurements Report No. 109, Bethesda MD (1991). *See*, Exhibit 10. WRT was able to draw no conclusions for the Board on the meaning of this report except to say that it was improperly overlooked by the Illinois EPA in its preparation of this regulatory proposal. The Illinois EPA review this document and found only one reference to radium in particular on page 55. An Agency toxicology expert attempted to translate the dose provided in Table 7.5 on page 55 to a concentration value in pCi/L to estimate what concentration of radium in surface waters would provide a dose to aquatic life comparable to the dose to humans from drinking water consumption relied on by the MCL. This conversion resulted in an extremely high value of 22,000 pCi/L. See, Exhibit 12 at No. 2. None of the commenters have thus far provided a different interpretation of that document.

Observational Study of Round Lake in Florida

WRT also submitted an unpublished, non-peer reviewed study from a lake in Florida called Round Lake. *See*, Attachment D to Exhibit 14. That study found high concentrations of radium in mussels in a lake that was being augmented at extremely high

rates with groundwater from a high radium aquifer. This study merely recorded radium concentrations but made no conclusions about whether any adverse environmental impacts were observed in the mussels or riparian mammals inhabiting the area. It seems clear that this research is being conducted on a unique ecosystem that faces significant challenges not found in Illinois streams or even in Illinois lakes.

Department of Energy Screening Model

WRT presented testimony on and excerpts from another document from the Department of Energy entitled "A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota" DOE-STD-1153-2002 (2002) (hereinafter referred to as "DOE Model"). *See*, Exhibit 15. WRT witnesses presented testimony that this self-described screening tool provided support for maintaining the current water quality standard of 1 pCi/L radium 226. The authors of the model do not support its use for the purpose of setting water quality standards but instead developed it as a tool for doing first tier evaluations of Department of Energy clean-up sites. Exhibit 15 at iii. The evidence presented in the Record at hearings three and four seems to suggest that while this model is not the sort of document that would be used for setting water quality standards, it might have some role in this process were realistic assumptions regarding Illinois plant and animal life, stream and sediment conditions and other factors to be utilized. It would be unwise and setting a bad precedent for future rulemakings for the Board to conclude that the default assumptions in this model presented a valid basis for a statewide General Use water quality standard. To accept the default assumptions of the DOE Model as a water quality standard or to leave the existing standard unchanged as suggested by WRT would leave many publically owned treatment works in Illinois, including any who choose to

usie WRT's system to comply with the MCL of 5 pCi/L, out of compliance with the surface water quality standard.

Other information and testimony

In addition to the above studies, Dr. Brian Anderson testified to an internet search he conducted to conclude that the Illinois EPA's preparation of this proposal had been irresponsible and faulty. Tr. of October 21, 2004 Hearing at 14-16. Dr. Anderson did not provide the Board with a print out of the "hits" received in that search and admitted he did not review any of the documents for their relevance to this proceeding. Tr. of October 21, 2004 Hearing at 46. The Illinois EPA believes that, upon further review, the Board and any other unbiased observer will be able to conclude that there is insufficient science available to make the determination the Board is asked to make in water quality standards proceedings with regards to radium 226 and 228.

Testimony presented at all four hearings supports the Agency's consistent position that currently there is virtually no data regarding radium in the Illinois environment. The Illinois EPA was able to present the example of radium sampling done once in the Fox River that obtained a value of less than 1 pCi/L. Statement of Reasons at 3. Neither the Illinois EPA, U.S. EPA, the Division of Nuclear Safety at the Illinois Emergency Management Agency ("IEMA") nor any other regulatory Agency with a presence in Illinois is known to have ambient water quality or sediment data available for the Board to consider in this proceeding. The question for the Board to consider is whether this absence of data and scientific studies is a result of ineptitude on the part of each of these regulatory bodies or whether it is based on the conclusion by experts in the field that the possibility of measurable environmental impacts was not deemed plausible

enough to justify the dedication of limited research dollars and staff time. Tr. of October 22, 2004 hearing at 357.

Information was requested by the Board at the fourth hearing regarding effluent limits for radium placed on those facilities that must be licensed by the Division of Nuclear Safety at IEMA or its federal counterparts. Tr. of October 21, 2004 hearing at 138. It is the Illinois EPA's understanding that information to that effect will be submitted by IEMA in this proceeding. In summary, the discharge standard for IEMA licensees to surface waters is 60 pCi/L and a much higher standard applies to discharges to sanitary sewers. 32 Ill. Adm. Code 340, 10 CFR Part 20 Appendix B Table 2.

WRT submitted an enormous quantity of information outside the scope of this proceeding. Primarily, this irrelevant information focused on issues of worker safety, radium in sludge and alternative treatment technologies for drinking water. The Illinois EPA does not dispute the importance of any of these points in the proper context. Worker safety issues are beyond the expertise and jurisdiction of either the Illinois EPA or the Board and fall within the expertise of IEMA, the Illinois Department of Labor or the Occupational Safety and Health Administration. The Illinois EPA does rely on the expertise of IEMA staff on radiation safety issues in guiding permitting decisions the Agency makes. Issues regarding radium in sludge are addressed currently through a Memorandum of Agreement between Illinois EPA and the former Department of Nulcear Safety and will be addressed in more detail in an upcoming rulemaking proceeding before the Board on regulations specifically applicable to the land application of sludge. Finally, the Illinois EPA expresses no opinion in this proceeding regarding the efficacy or wisdom of WRT's as yet unproven radium removal technology. The Board simply can

not mandate or prohibit any particular technology or group of technologies through a water quality standards proceeding. Treatment technology requirements for drinking water facilities could be addressed through amendments to the Board's public water supply treatment regulations or wastewater pre-treatment regulations.

Radium Water Quality Standards in Other States

U.S. EPA has established no radium water quality criteria document or guidance and does not require states to regulate radium levels in surface waters. In developing this proposal and in responding to additional concerns raised by commenters, the Illinois EPA contacted a number of other states regarding their radium water quality standards. A table documenting those standards was submitted to the Board on November 23, 2004 in response to the Board's request for additional information. In summary, Illinois EPA's technical staff looked into radium water quality standards in 13 other states and the Ohio River Sanitation Commission, ("ORSANCO").[3] These 13 states and ORSANCO were chosen because they either neighbored Illinois or were thought to have radium issues similar to those seen in Illinois.

Of these thirteen states, four states have standards similar to that proposed by Illinois EPA and four states have no radium water quality standard at all. Arizona, Utah, Iowa and Oklahoma have water quality standards of 5 pCi/L applicable only to waters designated for domestic water supply use or as Public Water Intakes. Other waters in these states have no radium water quality standard -- just like in Illinois EPA's proposal

[3] The states researched were as follows: Arizona, California, Florida, Iowa, Michigan, Ohio, Oklahoma, Utah, Wisconsin, Colorado, Missouri, Indiana and Minnesota.

to the Board.[4] The four states that have no water quality standards for radium are Michigan, Ohio, Wisconsin and Minnesota.

Of the remaining five states, three states have radium water quality standards of 5 pCi/L for all waters. These states are Florida, Colorado and Missouri. None of these states have developed their standard based on protection of wildlife or aquatic life but rather have based these standards on the presumption that protection of human health will guarantee protection of the environment. In addition, Indiana has established a standard of 3 pCi/L for Public Water Intakes and other waters in the state have no standard. California has developed a narrative for all waters, which states "Radionuclides shall not cause impact to humans, aquatic life or wildlife." Finally, ORSANCO's water quality standard is 4 pCi/L for the Ohio River which has been designated as a Public Water Supply.

Therefore, looking at these other states' water quality standards for radium, Illinois EPA's current radium water quality standard is significantly and unjustifiably more stringent than that of any other State. Other States generally have either adopted something similar to what Illinois EPA has proposed or have simply relied on the MCL as a safe level for protection of all uses of the receiving stream absent more specific scientific information. Illinois EPA is aware of no State that has established a water quality standard for radium based on the protection of the aquatic life or wildlife use.

CONCLUSION

A relatively large and confusing Record has developed in this proceeding that began in the eyes of most participants as an uncontroversial one. There is no dispute that

[4] Utah also has an alpha-emitter standard of 15 pCi/L present for wildlife protection.

the existing water quality standard is the result of a thirty year old mistake. Some argue it should remain broken, but most agree that it should be fixed. The disagreements in this proceeding are primarily over how to establish a water quality standard that will protect aquatic life and wildlife in Illinois when there is insufficient science available to answer the questions that must be asked when setting a standard. The information gaps include the absence of water quality, sediment or biological data; the absence of controlled, experimental toxicological or radiation studies; and the absence of U.S. EPA or other regulatory guidance. It is not entirely clear why so little attention has been given to the question of what level of radiation exposure is acceptable on a population basis for non-humans, but it may be possible over the next three years or at some other point in the future to resolve some of these information gaps by acquiring additional data. It may also be possible to use future data in conjunction with the existing D.O.E. model or some yet to be developed tool to attempt to do something no other State has yet done – develop a water quality standard for the protection of the aquatic life and wildlife use. Should this or any additional science become available, the Illinois EPA will again propose revision of the radium water quality standard to the Board. In the meantime, the Illinois EPA asks the Board to correct a mistaken regulation and not require the wastewater treatment community to comply with a water quality standard more stringent that its drinking water standard when all available information suggests that all human consumption is the most sensitive use for this parameter.

The Illinois EPA appreciates the time and resources the Board has dedicated to the resolution of this regulatory proceeding and the opportunity the Board has granted all

parties to the proceeding to participate and present documents and testimony for the Board's consideration.

WHEREFORE, for the reasons stated above, the Illinois EPA respectfully requests that the Board proceed to Second Notice on the proposed amendments to the radium water quality standards.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: _____
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December 8, 2004

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STATE OF ILLINOIS)
) SS.
COUNTY OF SANGAMON)

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached Post-Hearing Comments of the Illinois Environmental Protection Agency, upon the person to whom it is directed, by placing it in an envelope addressed to:

TO: Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph Street, Suite 11-500
Chicago, Illinois 60601

SEE ATTACHED SERVICE LIST

and mailing it by First Class Mail from Springfield, Illinois on December 8, 2004, with sufficient postage affixed.

Cynthia Sims

SUBSCRIBED AND SWORN TO BEFORE ME

this 8th day of December, 2004

Cynthia L. Wolfe
Notary Public

OFFICIAL SEAL
CYNTHIA L. WOLFE
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 3-20-2007

THIS FILING IS SUBMITTED ON RECYCLED PAPER

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