

DEC 22 2004

IN THE MATTER OF:)
)
REVISIONS TO RADIUM QUALITY)
STANDARDS: PROPOSED NEW 35 ILL. ADM)
CODE 302.307 and AMENDMENTS TO)
35 ILL. ADM. CODE 302.207 and 302.525)

STATE OF ILLINOIS
Pollution Control Board

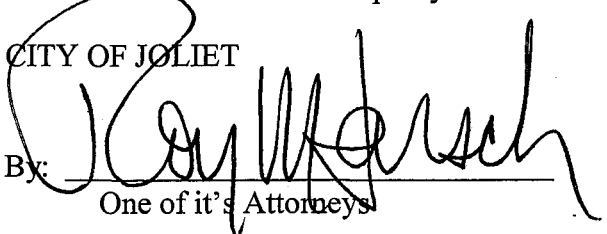
R 04-21
(Rulemaking—Water)

NOTICE

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 today filed with the Office of the Clerk of the Pollution Control Board the **MOTION TO FILE ADDITIONAL PUBLIC COMMENT TO PREVENT MATERIAL PREJUDICE FROM GROSSLY MISLEADING SUBMISSION IN THIS PROCEEDING.** a copy of which is herewith served upon you.

CITY OF JOLIET
By: 
One of it's Attorneys

Dated: December 22, 2004

GARDNER, CARTON & DOUGLAS
Roy M. Harsch
Gardner Carton & Douglas LLP
191 North Wacker Drive
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Chicago, Illinois 60606
(312) 569-1441

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**MOTION TO FILE ADDITIONAL PUBLIC COMMENT TO PREVENT
MATERIAL PREJUDICE FROM GROSSLY MISLEADING SUBMISSION IN
THIS PROCEEDING**

The City of Joliet ("City"), by its attorneys Gardner Carton & Douglas LLC and pursuant to 35 Il. Adm. Code 102.108(b), moves to submit an additional public comment to the Board in this proceeding. This comment is intended to respond to a grossly misleading submission made during the public comment period to the Illinois Pollution Control Board ("Board") that would materially prejudice the City if allowed to remain unrefuted in the record. In support thereof, the City states as follows:

1. The City has been an active participant in this matter at the hearings and in public comments, and has expended its own funds to put to the test technology by Water Remediation Technologies ("WRT") alleged to be the solution to the issue of radium in drinking water. The City has also engaged a preeminent Certified Health Physicist, Mr. Eli Port, to assist with comments to the Board.

2. Mr. Port reviewed Public Comment Number 26 filed by WRT which includes in part the December 7, 2004 letter from Dr. Adams. As set forth in Exhibit 1, Mr. Port believes the analysis of Dr. Adams to be a gross misrepresentation of applicable

standards, unduly alarming and greatly exaggerated on the health risks, and unfounded by reference to standard sources of information. These include:

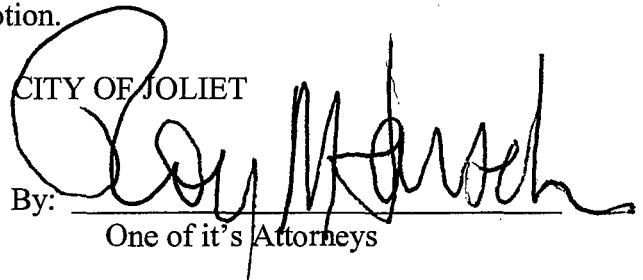
1. Reliance upon an obsolete standard;
2. Failure to use a tissue weighting factor;
3. Relying upon a physical impossibility.

Mr. Port has specifically requested the opportunity to file an additional public comment, which is attached to this motion as Exhibit 1.

3. The City believes it would be materially prejudiced and the Board and public may be misled if these comments were allowed to remain unrefuted in the record. Section 102.108(d) of Board rules allow the hearing officer or the Board to accept comments filed outside the public comment period where material prejudice would result if those comments were not permitted. 35 Il. Adm. Code 102.108(d). The claims in this comment were not made in the hearings and could consequently not be refuted.

4. Mr. Port's comments can only help the Board and the public to understand the issues in this proceeding.

WHEREFORE, the City of Joliet moves the hearing officer or the Board to accept the public comment of Mr. Port, attached to this motion.

CITY OF JOLIET
By: 
One of it's Attorneys

Dated: December 22, 2004

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December 22, 2004

Dennis Duffield, P.E., Director
Department of Public Works and Utilities
City of Joliet
921 Washington Street
Joliet, IL 60431

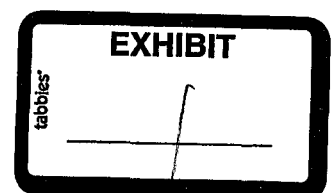
Dear Mr. Duffield:

I have read the misleading December 7, 2004, comments filed by Water Remediation Technology's Health Physicist, Theodore G. Adams, and find that the gross errors and misstatements in the filing require a response. The analyses in the Adams letter are a misapplication of the science and principles of radiation protection and are not supported by theory or fact. Their gross exaggerations of public dose and the consequences may serve the interests of Mr. Adams' client but they do not serve the interests of the public or of workers, whom they purport to protect. I am requesting that you ask Roy Harsch to file this letter with the Illinois Pollution Control Board (Board).

The Adams letter ranges over a wide variety of issues in addressing five subjects and contains analyses that are unintelligible and scientifically unsupportable. In this letter I address the first subject in the Adams letter, **Potency of radium particles and behavior in POTWs.**

It is important to note that the Adams letter cites the concerns of the NRC and the Agreement States. Illinois is an Agreement State and the Division of Nuclear Safety of the Illinois Emergency Management Agency (IEMA) is among the most respected Agreement State programs in the country. It would be advisable for the board to turn to IEMA for their input on public and worker radiation safety. The chief of the Bureau of Environmental Safety and other members of IEMA's staff are professionals certified by the American Board of Health Physics, the certifying body for the profession of Radiation Protection.

An obvious failure of the Adams letter is the constant reference to a dose of 320 mrem/hr, calculated from a standard that is no longer used (Page 1). Adams acknowledges that the current standard averages dose over 10 cm², but continues to refer to the



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dose calculated using an obsolete standard, one that averages the dose over an area of 1 cm^2 (Attachment 1, Page 4).

An additional defect in the Adams letter is the failure to use a tissue weighting factor, W_T for skin dose. The annual public dose limit, 100 mrem, is for whole body exposure. When dose is to the skin, a tissue weighting factor is used to normalize the risk. Tissue weighting factors are intended to ensure that a dose to various organs produces broadly the same degree of detriment irrespective of the tissue or organ. The risk to an individual depends upon which tissues or organs received a radiation dose and the fraction of the organ that is involved. The NCRP 60 weighting factor, W_T , for the skin of the whole body is 0.01. This may be further adjusted for the fraction of skin of the whole body represented by 10 square cm.

The analysis in the Adams letter is predicated upon a three gram bolus of hydrous manganese oxide (HMO) with a Ra-226 concentration of 70,000 pico curies per gram (pCi g^{-1}) passing through a sewage treatment plant (Attachment 1, Page 3). This is without scientific basis and may result from a failure to understand that the specific activity of a microscopic particle is not representative of the specific activity of the mass in which the particle may be found.

HMO is added to drinking water at the rate of 1 milligram per liter in a radium removal process. The HMO with the attached radium is collected on filters. As the HMO and other finely divided particles accumulate on filters, the flow is inhibited and it is necessary to backwash the filters. The backwashed material is disposed of to the sanitary sewer system through which it flows with other wastes to the wastewater treatment plant.

In the wastewater treatment plant, the finely divided particles are further mechanically mixed with other wastes and are eventually removed in the sludge at the end of the treatment process. It is not physically possible for the speculated three gram mass of particles in the effluent of the drinking water plant to flow through the sewer system, pass through the wastewater treatment plant, and be reconstituted as a solid bolus of concentrated material.

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Rather than hypothesizing a physically impossible solid bolus of concentrated material, Mr. Adams should have used the actual maximum concentration in Joliet sludge, 18.3 pCi g^{-1} . Working the material into the soil would further reduce the concentration. To be conservative, it is assumed that some sludge material is not diluted by being mixed with soil and could be on a skin surface. Using the skin dose conversion factor from the Adams letter, the skin dose from 18.3 pCi g^{-1} is correctly calculated below.

Ra-226 concentration in sludge = 18.3 pCi g^{-1}
Mass of sludge = 3 g
Area over which dose is averaged = 10 cm^2
Ra-226 skin dose conversion factor (SDCF) = $0.25 \text{ rem hr}^{-1}/\mu\text{Ci g}^{-1}$
= $2.5 \times 10^{-4} \text{ mrem hr}^{-1}/\text{pci g}^{-1}$
 $W_T = 0.01$ Effective Dose/skin dose

$$\dot{H} = \frac{18.3 \text{ pCi g}^{-1} \cdot 3 \text{ g} \cdot 2.5 \times 10^{-4} \text{ mrem hr}^{-1}/\text{pci g}^{-1} \text{ cm}^{-1} \cdot 0.01}{10 \text{ cm}^2} = 1.4 \times 10^{-5} \text{ mrem hr}^{-1}$$

This results in a dose of 8.4×10^{-5} mrem in a six hour period rather than the 32 mrem or 320 mrem repeatedly stated by Adams. Thus, Adams exaggerated the skin dose to the public by more than five orders of magnitude and Adams also overstates the risk.

Adams repeatedly refers to unnecessary risks of skin cancer and lesions. The risk of skin cancer from the dose he calculated is essentially zero. Lesions and other acute effects have never been reported from doses in the range of Adams' calculations.

As in the case of his gross exaggeration of skin dose, Adams similarly uses a concentration that is not supportable in calculating internal dose. Using his method and the correct conservative sludge concentration, the internal dose resulting from the ingestion of two grams of sludge containing 18.3 pCi g^{-1} Ra-226 is calculated below.

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$$\begin{aligned} \text{CEDE} &= 5 \text{ rem} \times 2\text{g} \times 1.83 \times 10^{-5} \text{ pCi g}^{-1} / 2 \text{ } \mu\text{Ci} \\ &= 9.2 \times 10^{-5} \text{ rem, or } 0.092 \text{ mrem} \end{aligned}$$

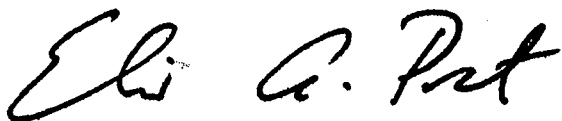
The public dose from ingestion of sludge is more than three orders of magnitude lower than the exaggerated 350 mrem Adams value (Page 1).

Later, toward the end of his letter, Adams returns to the subject of the potency of radium particles and their behavior in POTWs. Mr. Adams first discusses the impact from uranium in Kiski Valley, Pennsylvania. He fails to mention that the incident he described resulted from the processing of nuclear fuel. He also omits the fact that on June 22, 2004, prior to the date of his letter, the Nuclear Regulatory Commission determined that the ash described by Mr. Adams could be released for unrestricted use (SECY-04-0/02). It is difficult to relate the release of material from the processing of nuclear fuel to the release of radium in concentrations found in well water.

Mr. Adams goes on to discuss the release, in Ohio, of one to two grams of cobalt 60 (Co-60). He fails to disclose that the specific activity of Co-60 is 1100 curies per gram and that the activity of cobalt 60 released in Ohio was at least several thousand curies. Again, it is difficult to correlate this release, thousands of curies of Co-60, with the release of radium in the concentrations in well water. The discussions of these releases can only serve to mislead the Board.

The above assessments demonstrate that the Adams letter is not credible based upon its lead subject. Other sections also may prove to be fatally flawed. It may be best if the Board ignores the Adams letter and seeks IEMA's counsel on issues of public and worker radiation safety. Please call me at 847-965-1999 if you have any questions or require additional information.

Sincerely,



Eli A. Port, CHP, CIH, P.E.

CERTIFICATE OF SERVICE

It is hereby certified that true copies of the foregoing **MOTION TO FILE**

ADDITIONAL PUBLIC COMMENT TO PREVENT MATERIAL PREJUDICE FROM

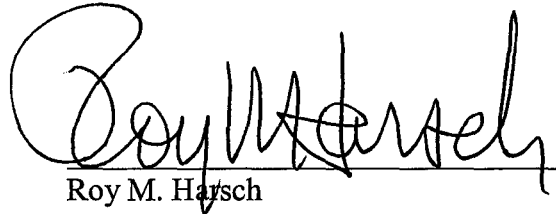
GROSSLY MISLEADING SUBMISSION IN THIS PROCEEDING, were hand delivered to

the following:

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-600
Chicago, Illinois 60601

and mailed via First-Class Mail on December 22, 2004 to the following:

SEE ATTACHED SERVICE LIST



Roy M. Harsch

THIS FILING IS SUBMITTED ON RECYCLED PAPER

R 04-21 SERVICE LIST

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