

FACT SHEET

Proposed Amendments to Licensing of Radioactive Materials, 32 Ill. Adm. Code 330 providing an exemption for possession and disposal of radium contaminated sludge and residuals from sewage and water treatment facilities.

Why are Proposed Amendments necessary?

Illinois Emergency Management Agency (IEMA) statutes define radium contaminated sludge and residuals from sewage and water treatment facilities as low level radioactive waste. Even though IEMA and Illinois Environmental Protection Agency (IEPA) have had a long standing Memorandum of Agreement (MOA) concerning conditions included in IEPA sewage and water treatment permits that address the handling and disposal of radium resulting sludge and residuals, the conditions were never promulgated into a rule pursuant to the Administrative Procedure Act [5 ILCS 100] (APA).

The Illinois Pollution Control Board entered an opinion on a permit appeal by the City of Joliet that the existing MOA affected the rights of persons/entities outside IEMA and IEPA and, therefore, constitutes a rule under the Administrative Procedure Act. [See PCB 2009-025] Unless a rule is promulgated in conformity with the APA, it is not valid or effective against any person or party and may not be invoked by an administrative agency for any purpose. IEMA is in agreement with this opinion and has put forth the proposed amendments.

What is the basis for the MOA between IEMA and IEPA?

USEPA rules requiring the removal of radium from drinking water created major management and disposal issues for municipalities now dealing with significant concentrations of radium in their sewage and water treatment system sludge. The 1984 MOA between the IEPA and what was then the Illinois Department of Nuclear Safety (now the IEMA Division of Nuclear Safety) was developed in an attempt to define the roles of each agency relative to the regulation of radium contaminated sludge and provide cost effective alternatives to handling and disposing of radium contaminated sludge that were still protective of human health and the environment. *Although not clearly stated as an objective, one important side effect of the MOA was that it provided regulatory relief to treatment facilities who now found themselves involved in storage, handling and disposal of radium contaminated sludge at concentrations that would typically be classified as radioactive waste.*

IEMA radioactive material licensing requirements do not include a specific exemption for possession of Radium 226 and Radium 228 that is based on limited quantities or concentration. In the absence of the MOA and supporting documents, sewage and water treatment facilities would be required to comply with detailed and potentially expensive licensing requirements including:

- Radioactive materials license application submittal and potential fees.

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- Development and staffing of radiation safety programs, including personnel and environmental monitoring.
- Packaging, transport, treatment and disposal of material at a licensed low-level radioactive waste (LLRW) disposal site.
- Posting of financial assurance to guarantee cleanup.
- Register as a LLRW generator
- Report annual waste production and payment fees

The MOA and management guidance dated December 1, 1984, allowed local disposal options and criteria for disposal of sludges with radium concentrations below 5 pCi/g and in the range between 5 and 50 pCi/g. It also allowed for land application (soil conditioning) of sludges in these same activity ranges, provided the radium concentration was less than 50 pCi/g and that the increase in the radium concentration for combined sludge/soil mixture did not exceed 0.1 pCi/g. Land application of sewage sludge was considered a viable option only because the sludge contains minerals that increase the nutrient value of the soil and by limiting the radium concentrations, the overall exposure risk, under the agricultural scenario, could be managed in a manner that was consistent with other types of fertilizers and did not increase overall population dose.

In the period since the 1984 MOA a number of regulatory standards or the manner in which they are applied have changed. In some cases (U.S. Nuclear Regulatory Commission), moving to a dose base standard may have increased the allowable concentrations for residual materials, under specific scenarios. In other cases (U.S. Environmental Protection Agency), existing standards have been more or less abandoned, with movement toward more conservative values. *One example is the 5 and 15 pCi/g concentrations in 40 CFR 192, the mill tailings standard for remediation of residential sites, has been largely ignored in favor of a 5 pCi/g at any depth standard used at most Superfund sites, including two such sites within the State of Illinois.*

Has IEPA and the public had an opportunity to comment on this proposed rulemaking?

IEMA and IEPA have been in active consultation on this issue since a meeting held on November 11, 2003. Routine communications and meetings between the agencies and the City of Joliet have been ongoing since an initial meeting with the City of Joliet on June 15, 2004; and has continued meeting over several years concluding with a meeting as recently as August 14, 2007.

Based on these years of discussion and detailed analysis of the existing limits on the allowable increase in Radium concentrations in soil after land application, IEMA determined that an increase from 0.1 pCi/g to 0.4 pCi/gm could be justified, while remaining protective of public health and the environment. This represents a 300% increase over the previous standard. With concurrence of IEMA, IEPA issued a permit renewal to the City of Joliet with the new limit of 0.4pCi/gm. in February 2007. IEPA has since issued additional permit renewals with this new limit to other communities.

A draft modification of the MOA was shared with IEPA on May 10, 2007. The City of Joliet has since appealed the new limit as still too restrictive before the Illinois Pollution Control Board. [See PCB 2009-025] The Board issued an opinion indicating the City of Joliet did not meet the burden of proof and ruled against the appeal. During the appeal process the Board also opined that the existing MOA was an unpromulgated rule and was not enforceable against third parties.

In correspondence dated September 4, 2008, IEMA requested that IEPA review the proposed rulemaking and provide comments. IEMA received comments on the proposed rulemaking from IEPA in a letter dated September 19, 2008. IEMA addressed all of IEPA's comments as part of the proposed rulemaking.

Currently, this proposed rulemaking is in the First Notice period which allows public comment for 45 days. Information for providing comments to IEMA was included in the First Notice documents published in the *Illinois Register*. IEMA also places its proposed rulemakings on its website.

What is the technical and regulatory basis?

An April 2008 paper (attached) entitled "Technical Justification for the 0.4 pCi/g Soil Concentration Increase Limit Associated with the Land Application of Water Treatment Residuals or Sewage Treatment Sludge Containing Natural Occurring Radium" outlines the process used to develop the current limit for increase in radium concentrations in treated soils. A number of regulatory guidance documents by federal, state and multi-agency research entities; information collected in meetings with IEPA and the City of Joliet; reviews of other states programs; and national and international solids release information were used to model and formulate the technical basis for the exemption while ensuring appropriate levels of protection for the public and environment.

The evaluation considered exposure pathways and dose limits both with and without radon and utilized what we believe was a common sense approach to determining an acceptable value for the increase in radium concentrations in soil as a result of land application. The process resulted in a 300% increase in the previous limit, from 0.1pCi/g to 0.4 pCi/g, while maintaining the control of potential public exposure pathways. We believe this provides a sound and defensible approach to continued regulation of the land application of sludge.

How do we compare with other states where land application is allowed?

The States of Wisconsin and Colorado both regulate the land application of radium contaminated sludge and wastewater residuals. The State of Wisconsin regulates the application of Ra226 only and allows for an overall increase of 1.0 pCi/g over an average background 1.0 pCi/g for a total of 2.0 pCi/g lifetime limit on applications. While the program appears to be less restrictive, permit holders are required to perform soil sampling, documenting the impacts of their applications, on a specifically defined density and frequency.

The State of Colorado also regulates the land application of contaminated sludge and wastewater residuals. While the Colorado application limit is 10 pCi/g, the factors in determining their limits, i.e. background Radium concentrations, type of agriculture and use scenarios, are likely to be significantly different than Illinois. Like Wisconsin, the State of Colorado provides closer regulation of entities involved in land application of sludge, requiring them to be generally licensed.

Other observations -

Following are a number of observations and discussions that have taken place regarding the regulatory framework surrounding this issue.

- Relief from licensing represents a significant cost savings for the regulated community. Every effort should be made to identify or continue the use of technologies that are effective at removing radium, without creating worker safety and exposure issues along with potential waste disposal issues that out weigh the benefits of their efficiency. That said, there may be such a thing as a system or model that is “too efficient” at removing radium, thus creating a waste stream that is no longer viable as a source for land application.
- Attempts to use remedial cleanup standards as defacto land application limits is inconsistent with regulatory policy and ALARA concepts. Remedial actions are traditionally the result of inadvertent or accidental contamination of sites and not the intentional mixture or redistribution of contaminated materials as prohibited by CERCLA. Land application of sludges is an attempt to optimize the benefit of nutrients present in sludges with the potential risks associated with the redistribution of radioactive materials. A policy that is too liberal in this direction could result in the intentional degradation of a natural resource.
- The Illinois land application limits were developed based on resident farmer scenarios and assumptions that provided for maximum flexibility in allowable concentrations. Considering geography and demographics, the areas of Illinois that are most heavily impacted by these regulations are the area that:
 1. Have the highest concentrations of NORM in their municipal wells
 2. Treat the largest volumes of water
 3. Are mostly densely populated, hence the water volumes
 4. Are most likely to continue urban sprawl which increases the likelihood that they will eventually develop the surrounding farmland where land application of sludges is currently taking place.
- Producers of sewage treatment sludges have several options for managing their sludge so the 0.4 pCi/g soil concentration limit is not exceeded. These include, but are not limited

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to, blending high and low concentration sludge, modifying application rates and frequency, alternating fields of application and limiting the number of applications on a specific field. In addition, producers can dispose of their sludge in a local landfill provided it meets the landfill's waste acceptance criteria. All these alternatives are more cost effective than disposing of the sludge in a licensed low-level radioactive waste disposal facility.

Item number 4 above and the potential indoor radon exposure issues created by the general increase in radium concentrations in soil is a primary issue and concern. The current and future owners of properties where land application is taking place are not likely to be in favor of deed or development restrictions that would be considered if radium levels increased to a point where exposure pathways and public dose began to be impacted.