



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

October 6, 2016

[

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SUBJECT: INDIANA RADIUM INSTITUTE-3 – REQUEST FOR INITIAL SITE VISIT AND TO PERFORM RADIOLOGICAL SURVEYS

Dear [ ]

I am writing to inform you that our records indicate that your property at [ ] is a site where radium-226 was previously used. Specifically, a building that was previously on your property was used as a Sanitarium, wherein radium was used to treat patients. If you are not the current owner of the property, please let us know whom we should contact. Radium-226 is a radioactive isotope that, in certain quantities, may pose a risk to public health and safety. Radium-226 is regulated by the U.S. Nuclear Regulatory Commission (NRC). We do not know whether there is a current radiological issue at your property, and it is important that you contact us at your earliest convenience. We are requesting access to your property to perform radiological surveys and to collect samples to determine whether there is any residual contamination resulting from this historical use of radium on your property. This testing will not damage your property and these tests will be conducted at no cost to you. If residual contamination at your property has already been remediated, please provide us with records describing cleanup activities and the status of the remediation.

To successfully complete our tests, we need to schedule an initial visit. The initial site visit will serve two purposes: 1) to determine whether there is any readily detectable radium contamination; and 2) to allow us to start planning a scoping survey, if needed. During our initial site visit we will determine if a follow-up scoping survey is necessary. The scoping survey will involve a more detailed radiological survey to determine if there is any residual contamination. After each visit, we will share results with you as soon as they are available.

These tests will determine whether your site requires remediation to remove residual contamination. Should remediation be required, we will provide additional information on any actions that may be necessary to ensure protection of public health and safety. Please be aware that under the NRC's regulations, site owners are responsible for the costs associated with these remediation activities; as a regulatory agency, the NRC cannot provide funding. This does not, however, preclude site owners from using alternative legal options that may be available under State or Federal law to fund remediation activities. We recognize that you may not be aware of

**INFORMATION IN THIS LETTER AND ITS ENCLOSURES HAS BEEN DESIGNATED AS PERSONALLY IDENTIFIABLE INFORMATION. UPON REMOVAL OF THE BRACKETED INFORMATION THE LETTER AND ITS ENCLOSURES CAN BE MADE PUBLICALLY AVAILABLE.**

[ ]

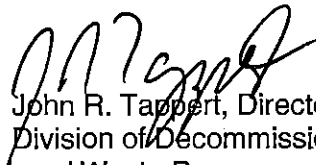
historical radium use at your site and we will continue to work with you to address and resolve this matter.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," upon removal of the bracketed information, a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

The enclosed Site Summary Report provides all of the information that the NRC has concerning historical radium storage at your property, which we found through a search of publicly available information. The enclosed Backgrounder provides more detail on the history of radium use and its potential health effects. The enclosed brochure provides an overview of the NRC.

We would like to work with you to schedule our initial site visit and answer any questions you might have. At your earliest convenience, please contact Mr. Matthew Meyer, Acting Chief, Materials Decommissioning Branch, Division of Decommissioning, Uranium Recovery and Waste Programs, Office of Nuclear Materials Safety and Safeguards, at (301) 415-6198, or Mr. Kenneth Kalman, Project Manager, at (301) 415-6664.

Sincerely,



John R. Tappert, Director  
Division of Decommissioning, Uranium Recovery  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 3038983

Enclosures:

1. Site Summary Report
2. Radium Backgrounder
3. U.S. Nuclear Regulatory Commission *Overview*

REGISTERED LETTER – RETURN RECEIPT REQUESTED

### Indiana Radium Institute: Site Summary

The following information was extracted from public records.

#### Address

[ ]

#### Site Description/History

According to early 1920s advertisements, the Indiana Radium Institute contained “ample laboratory facilities and consulting staff for accurate and scientific application of radium” (JAMA, 1921) and provided “radium for renting purposes” (JMSMS, 1921). Also, the advertisements referenced the use of radium in solution for emanation and suggested a relatively high activity of radium in their possession.

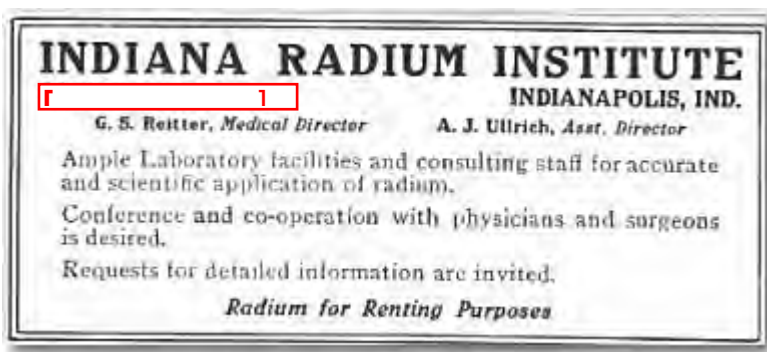


Figure 1. Advertisement from JAMA (1921)

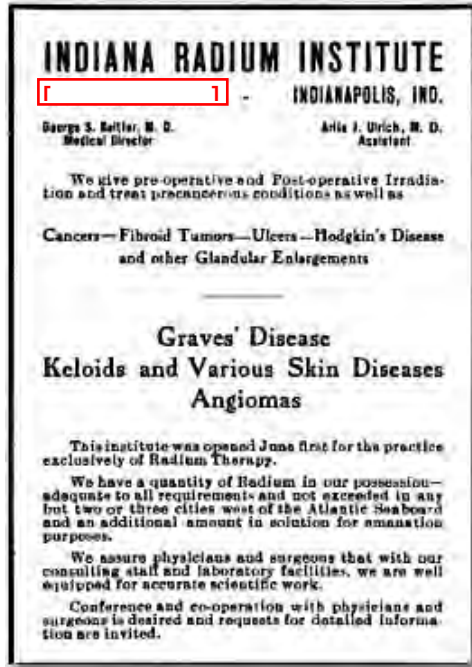


Figure 2. Advertisement from JMSMS (1921)

According to 1940 Census results found on ancestry.com (2015), the address appeared to be a residence for several women. There is no information in the public records about this address post 1940.

**The amount/extent of radium contamination at these sites (including historical information and/or informed assumptions about the radium facilities' structures/areas, processes, and activities)**

It is unknown the exact amount of radium that was available at this facility. According to advertisements, the Indiana Radium Institute performed accurate and scientific application of radium, rented radium, and used radium in solution for emanation.

Summary of Current Levels of Radium:

As of November 2015, current levels of radium are unknown based on information reviewed for this report.

**Location and population near the sites**

In order to identify the exact location of the former facility, a 1915 Sanborn Fire Insurance map (Indiana University, 2015) was overlaid on a high resolution aerial photo from 2006. The resulting image is Figure 3. The map shows the location of the former Indiana Radium Institute (sanitarium) on [redacted]. The location is currently within a parking lot for apartments to the south and the [redacted] easement to the north (see Figure 4). This area appears to be mostly residential.

A close-up of this location (Figure 4) shows that the Institute is no longer there. It is unknown when the building was demolished. The site may contain soil that is contaminated with radium.

Indianapolis is the capital of the U.S. state of Indiana and the county seat of Marion County. Indianapolis is the largest city in Indiana, second largest in the American Midwest, and 14th largest in the U.S. According to the 2010 U.S. census, the population of Indianapolis was 820,445; the 2014 population estimate for the city was 848,788 (United States Census Bureau, 2015).

[

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Figure 3. Location of Indiana Radium Institute ([ ], see red arrow). Image created by overlaying a Sanborn Fire Insurance map from 1915 (yellow and pink buildings) onto a 2006 aerial photo

[

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Figure 4. Enlargement of Figure 3 showing the location of Indiana Radium Institute in 1915.

**Current State/other Federal involvement**

As of November 2015, no information about radium cleanup was located in the public records.

**Current access, activities, and uses at the site**

There are apartments adjacent to the site location and other residences nearby. The rest of the area is part if the [ ] easement.

**Existing Engineering Controls**

There are no engineering controls.

## Prioritization Ranking

Radium is confirmed to have been present at the site based on historical documentation that radium was used at the facility. The original building has been demolished. The site consists of soil that is potentially contaminated by radium. The site is occupied or frequented by visitors. Therefore, the site is classified as Tier 1.

## References

Ancestry.com. 1940. Accessed June 3, 2015. 1940 Census. [

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Google Earth. 2014. Accessed June 3, 2015. <https://www.google.com/maps/>.

Indiana University. 2015. Accessed October 2015. Spatial Data Portal. Map number 02371\_04\_1915-0359.pdf.  
<https://spatialdata.iu.edu/DOQQS/state/sanborn/public/pdf/1915/>

Journal of the American Medical Association (JAMA). 1921. Advertisement for Indiana Radium Institute. Vol. 76: p 52. February 26, 1921.

Journal of the Missouri State Medical Society (JMSMS). 1920. Advertisement for Indiana Radium Institute. 17(10):xvii . 1920.

United States Census Bureau. Accessed October 2015.  
<http://www.census.gov/quickfacts/table/PST045214/1836003,00>.

## Radium

Radium was one of the first radioactive elements ever discovered. Marie and Pierre Curie unlocked the atom's secrets in 1898, opening the door for important innovations using radioactivity in medicine and industry. Radiation quickly became a consumer and medical sensation and radium was the posterchild. Experts concluded radiation was a lifesaver after finding it reduced tumor growth and was present in the waters at some health spas. Soon there were many radium products on the market that purported to improve health and vitality. But tragic stories began to emerge of the health impacts. Perhaps the most well-known is the "radium girls," who painted watch faces with glow-in-the-dark radium paint and developed infections and jaw cancer from licking their brushes into fine points.

### Early regulation

When evidence of harm began to emerge in the early 1900s, the states each made their own decisions about how to regulate. Courts also took varying approaches on victim compensation. The federal government took action to guard against false advertising and regulate mail shipments, conducted studies, and organized some voluntary protections.

As radioactive materials became more widely available following World War II, they remained largely under state control. Radium use declined in medical and consumer products in favor of other safer materials.

### Regulation today

Work on securing radioactive materials took on new urgency following the terrorist attacks on the United States in September 2001. Those attacks prompted the International Atomic Energy Agency to develop a code of conduct in 2004 to limit the potential for malicious acts. That code places one form of radium, known as radium-226, and other radioactive materials into categories based on their quantity and potential hazard.

The NRC has specific security requirements tied to these categories. As support for the IAEA code grew, Congress passed the Energy Policy Act in 2005, giving the NRC authority over radium-226. This law marked the first time the federal government had a comprehensive role in ensuring the safe use of radium-226.

Many states had developed strong programs for regulating radium and other naturally-occurring radioactive materials and it took time to transition authority. The NRC had regulations in place and fully assumed oversight in 2009. Initially, NRC staff worked exclusively with the military to identify sites



where radium might be present. These discussions made clear that the NRC's role would include ensuring that sites where radium was used are maintained in a way that protects public health and safety.

In 2016, the NRC and Department of Defense signed a [Memorandum of Understanding \(MOU\)](#) describing roles in the cleanup of radium and other unlicensed radioactive materials at military sites. The MOU and a [Regulatory Issue Summary](#) clarify NRC's jurisdiction over military radium. In late 2016, the NRC began monitoring two sites under the MOU: Treasure Island Naval Station in San Francisco and Dugway Proving Ground in Utah.

In 2013, the agency learned of two commercial sites where radium-226 had been found and other federal agencies had gotten involved. The Environmental Protection Agency was overseeing portions of the Waterbury Clock Company in Connecticut. The National Park Service was overseeing Great Kills Park in New York.

NRC staff is working with the current owner of the Waterbury Clock Company site. Contaminated areas of the site are under EPA oversight through its Brownfields Program, which provides assistance to clean up contaminated properties. NRC staff is working with EPA to clarify oversight roles and responsibilities under that program.

In 2016, NRC staff began developing an MOU with the National Park Service that will also clarify the NRC's jurisdiction over radium at Great Kills Park. The NRC is monitoring cleanup activities that the Park Service is implementing under Superfund, more formally known as the Comprehensive Environmental Response, Compensation and Liability Act.

Those projects prompted a search to identify sites in NRC's jurisdiction where radium was used, and to find out how much, if any, cleanup was done. This search was not a result of any known health and safety issues. Rather, because of its mandate to protect public health and safety, the NRC wanted to be sure there were no additional sites that might pose a risk.

With the help of the Oak Ridge National Laboratory, the NRC began to develop a fuller picture of commercial radium use. The lab produced a [catalog](#) of the various products developed and sold to the public in the early 20<sup>th</sup> century. By reviewing publicly available records, Oak Ridge identified sites where radium may have been used to make consumer goods. Then the lab looked for any cleanup records. Oak Ridge transmitted the results to the NRC in November 2015. Since that time, the agency has been working on plans to gather more information about those sites.

The NRC is working with state and local governments to identify any additional records that may help clarify whether any site cleanup has taken place. The goal is to ensure that public health and safety is adequately protected at these sites.

**October 2016**

## OTHER KEY OFFICES

- ◆ The **Office of Enforcement** develops policies and programs to enforce NRC requirements. Enforcement action is used as a deterrent to emphasize the importance of compliance with regulatory requirements and to encourage prompt identification and prompt, comprehensive correction of violations. The office manages major enforcement actions against licensees, and assesses the effectiveness and uniformity of enforcement actions taken by NRC regional offices. Enforcement powers include notices of violations, fines, and orders to modify, suspend or revoke a license. Two separate offices are responsible for investigations.
- ◆ The **Office of Investigations** conducts investigations of licensees, applicants, contractors and vendors. The office investigates all allegations of wrongdoing by individuals or organizations other than NRC employees and NRC contractors. In addition, the office keeps abreast of inquiries and inspections and advises on the need for formal investigations. It also keeps other components of the agency informed of matters under investigation as they affect safety.
- ◆ The **Office of the Inspector General** is a statutory post mandated by the Inspector General Amendments Act of 1988. The office conducts independent reviews and appraisals of internal NRC programs and conducts investigations of alleged wrongdoing by NRC employees and contractors.

## Office of Public Affairs

Washington, DC 20555-0001

Telephone: (301) 415-8200

Fax: (301) 415-3716

E-mail: [opa.resource@nrc.gov](mailto:opa.resource@nrc.gov)

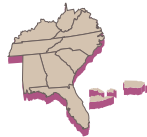
Website: [www.nrc.gov](http://www.nrc.gov)

## Regional Public Affairs Offices



### Region I

2100 Renaissance Blvd., Suite 100  
King of Prussia, PA 19406-2713  
(610) 337-5330 or 337-5331



### Region II

245 Peachtree Center Ave., NE., Suite 1200  
Atlanta, GA 30303-1257  
(404) 997-4417 or 997-4416



### Region III

2443 Warrenville Road, Suite 210  
Lisle, IL 60532-4352  
(630) 829-9663 or 829-9662



### Region IV

1600 E. Lamar Blvd.  
Arlington, TX 76011-4511  
(817) 200-1128



NUREG/BR-0099, Rev. 14  
June 2016

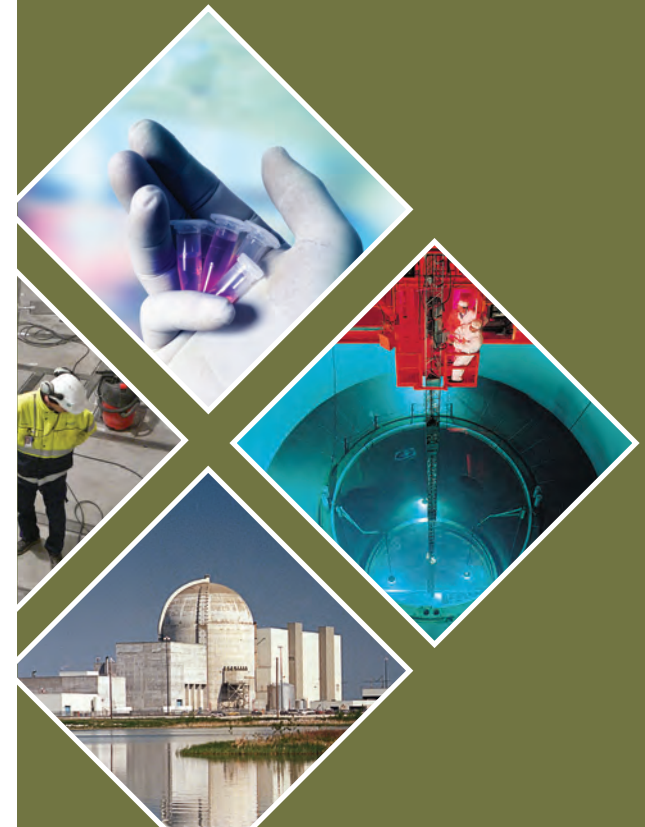
## STAY CONNECTED



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## U.S. Nuclear Regulatory Commission Overview



## NRC MISSION

The NRC licenses and regulates the Nation's civilian use of radioactive materials to protect public health and safety, promote the common defense and security, and protect the environment. Specifically, the NRC regulates commercial nuclear power plants; research, test and training reactors; nuclear fuel cycle facilities; and the use of radioactive materials in medical, academic and industrial settings.

The agency also regulates the transport, storage, and disposal of radioactive materials and waste, and licenses the import and export of radioactive materials. While the NRC only regulates industries within the United States, the agency works with agencies around the world to enhance global nuclear safety and security.

## STATUTORY AUTHORITY

The Energy Reorganization Act of 1974 created the NRC from the Atomic Energy Commission. The new agency was to oversee — but not promote — the commercial nuclear industry. The agency began operations on January 18, 1975. The NRC's regulations can be found in Title 10, "Energy," of the *Code of Federal Regulations* (10 CFR).

The NRC, its licensees (those licensed by the NRC to use radioactive materials), and the Agreement States (States that assume regulatory authority over use of certain nuclear materials) share a responsibility to protect public health and safety and the environment. Federal regulations and the NRC's regulatory program are key, but the primary responsibility for safely handling and using these materials lies with the licensees.



## ORGANIZATIONS AND FUNCTIONS

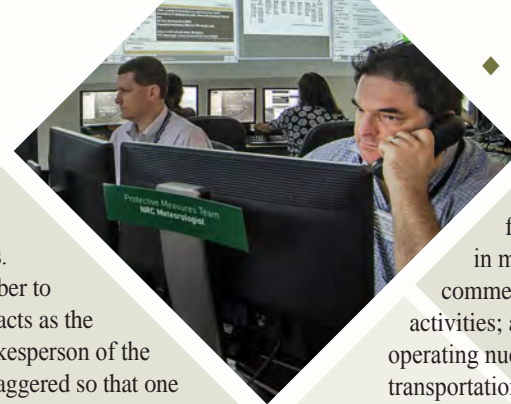
The NRC's Commission is made up of five members nominated by the President and confirmed by the U.S. Senate for 5-year terms. The President designates one member to serve as Chairman. The Chairman acts as the principal executive officer and spokesperson of the agency. The members' terms are staggered so that one Commissioner's term expires on June 30 every year. No more than three Commissioners can belong to the same political party.

The Commission formulates policies and regulations governing nuclear reactor and materials safety, issues orders to licensees, and adjudicates legal matters. The Executive Director for Operations carries out the policies and decisions of the Commission, and directs the activities of the program and regional offices. The NRC has about 3,600 employees and an annual budget of about \$1 billion.

The NRC is headquartered in Rockville, Md., and has four regional offices. The **Regional Offices** conduct inspection, enforcement (in conjunction with the Office of Enforcement), investigation, licensing, and emergency response programs. At least two NRC employees, called Resident Inspectors, are assigned to, and work out of, each nuclear power plant. The NRC also has a Technical Training Center in Tennessee.

The major program offices within the NRC include:

- ◆ **The Office of Nuclear Reactor Regulation.** Handles all licensing and inspection activities for existing nuclear power reactors and research and test reactors.
- ◆ **The Office of New Reactors.** Oversees the design, siting, licensing, and construction of new commercial nuclear power reactors.
- ◆ **The Office of Nuclear Security and Incident Response.** Oversees agency security policy for nuclear facilities and users of radioactive materials. It provides a safeguards and security interface with other Federal agencies and maintains the agency's emergency preparedness and incident response program.



◆ **The Office of Nuclear Material Safety and Safeguards.** Regulates activities and oversees the regulatory framework for the safe and secure production of commercial nuclear fuel and the use of nuclear material in medical, industrial, academic and commercial applications; uranium recovery activities; and the decommissioning of previously operating nuclear facilities. It regulates safe storage, transportation, and disposal of high- and low-level radioactive waste and spent nuclear fuel. The office also works with Federal agencies, States, and Tribal and local governments on regulatory matters.

- ◆ **The Office of Nuclear Regulatory Research.** Provides independent expertise and information for making timely regulatory judgments, anticipating problems of potential safety significance, and resolving safety issues. It helps develop technical regulations and standards and collects, analyzes, and disseminates information about the safety of commercial nuclear power plants and certain nuclear materials.

Three independent groups serve the Commission:

- ◆ **Advisory Committee on Reactor Safeguards,** mandated by statute, is a committee of scientists and engineers independent of NRC staff. They review and make recommendations to the Commission on all applications to build and operate nuclear power reactors, the safety aspects of nuclear facilities and the adequacy of safety standards. This includes update license amendments and license renewals.
- ◆ **Advisory Committee on the Medical Uses of Isotopes** is made up of physicians and scientists who consider medical questions and, when asked, give expert opinions to the NRC on the medical uses of radioactive materials.
- ◆ **Atomic Safety and Licensing Board Panel** provides a way for the public to get a full and fair hearing on civilian nuclear matters. Individuals who are directly affected by licensing action involving certain facilities producing or using nuclear materials may submit a request to participate in a hearing before these independent judges.

[ ]

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Sincerely,

*/RA/*

John R. Tappert, Director  
Division of Decommissioning, Uranium Recovery  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 3038983

Enclosures:

1. Site Summary Report
2. Radium Backgrounder
3. U.S. Nuclear Regulatory Commission *Overview*

REGISTERED LETTER – RETURN RECEIPT REQUESTED

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