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

May 19, 2017

Mr. Ashley Lathrop
Director of Membership and Administration
International Association of Assessing Officers
314 West 10th Street
Kansas City, Missouri 64105-1616

SUBJECT: RADIUM DYE COMPANY—RESULTS AND CONCLUSIONS OF THE U.S. NUCLEAR REGULATORY COMMISSION'S INITIAL SITE VISIT

Dear Mr. Lathrop:

I am writing to provide you with the results of the U.S. Nuclear Regulatory Commission (NRC) staff's initial site visit to the property at 318/314 West 10th Street, Kansas City, Missouri, performed on February 23 and 24, 2017.

The purposes of the initial site visit were to: 1) determine if there are health and safety concerns to current property occupants or site visitors; and 2) identify the locations with the potential for contamination and gather information for a scoping survey plan, should it be needed.

As described in our site summary, attached to our letter dated October 6, 2016,[1] a facility that used radium-226 (Ra-226) in their products once operated in the building at 318/314 West 10th Street in the early 1900s. Based on the history of the property and its redevelopment, NRC staff considered the likelihood of discrete sources of Ra-226 being located within the existing property structure to be negligible. Therefore, the initial site visit focused on the accessible areas within and outside of the building to identify any discrete Ra-226 sources.

As discussed within the enclosed report, NRC staff and staff from the Oak Ridge Institute for Science and Education (ORISE) performed radiological surveys consisting of gamma radiation scans and exposure rate measurements. Surveys were conducted on accessible areas of the property, covering approximately 70 percent of the areas inside and 25 percent of the area outside of the building. NRC did not survey under the current driveway or building foundations.

NRC staff concludes, based on radiological conditions observed during the initial site visit and a review of the property history, that: 1) there is no indication of discrete sources of Ra-226 on the portions of the property that were evaluated; and 2) a follow-up scoping survey is not required as it would be unlikely to yield additional information. Given these conclusions, no further actions are needed from you at this time.

[1] Agencywide Documents Access and Management System Accession No. ML16277A255. It should be noted that the letter contained a typographical error. It referred to your property at "308 & 314 West 10th Street," rather than 318/314 West 10th Street.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," 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.

If you have any questions concerning this letter, please contact Mr. Stephen Koenick, Chief, Materials Decommissioning Branch, Division of Decommissioning, Uranium Recovery and Waste Programs, Office of Nuclear Materials Safety and Safeguards, at (301) 415-6631, or Mr. Jeffrey Whited, Project Manager, at (301) 415-4090.

Sincerely,

/RA/

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

Docket No.: 03038972

Enclosure:
Site Status Report for Radium Dye Company (318/314 West 10th Street)

REGISTERED LETTER – RETURN RECEIPT REQUESTED

Enclosure

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION:

SITE STATUS REPORT FOR THE RADIUM DYE COMPANY AT 318/314 WEST 10th STREET, KANSAS CITY, MISSOURI

May 19, 2017

EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) requested that the Oak Ridge Institute for Science and Education (ORISE) perform a radiation survey of the property at 318/314 West 10th Street in Kansas City, Missouri. This property contains a structure that once contained the former Radium Dye Company, which used radium in their products in the early 1900s. The objective of this survey was to locate possible discrete sources of radium, if any, that would be associated with the former Radium Dye Company's operations.

ORISE performed the radiation survey on February 23-24, 2017, and did not identify elevated levels of radiation in accessible areas. Because no elevated levels of radiation were identified, ORISE concludes that discrete sources of radium-226 are likely not present in this facility. Based on these results, it is recommended that the NRC not pursue additional action at the 318/314 West 10th Street property.

SITE STATUS REPORT

Property: Former Radium Dye Company
318/314 West 10th Street
Kansas City, Missouri 64105

Docket Number: 03038972

Current Property Name: Adler Building

Current Property Owner: International Association of Assessing Officers

Inspection Dates: February 23-24, 2017

Inspector(s): Jack Giessner/NRC, Daniel Strohmeyer/NRC, supported by Kaitlin Engel/ Oak Ridge Associated Universities (ORAU)

1.0 INTRODUCTION

The Energy Policy Act of 2005 amended section 11e.(3) of the Atomic Energy Act of 1954 to place discrete sources of radium-226 (Ra-226) under U.S. Nuclear Regulatory Commission (NRC) regulatory authority as byproduct material. The NRC is evaluating properties where a review of historical information has identified Ra-226 use. The property at 318/314 West 10th Street in Kansas City, Missouri, was identified as the former Radium Dye Company, a facility that used Ra-226 in their products during operations in the early 1900s (Oak Ridge National Laboratory (ORNL) 2015). The objectives of the initial site visit were to determine if discrete sources of Ra-226 and/or distributed Ra-226 contamination are present, to identify the areas of highest contamination, to determine if there are any current health and safety concerns, and to determine if a scoping survey is needed. Surveys were performed as described within NRC's procedure, Temporary Instruction (TI) 2800/043, "Inspection of Facilities Potentially Contaminated with Discrete Radium-226 Sources" (NRC 2016).

Data collected during the February 23-24, 2017, site visit, which includes gamma radiation scans and exposure rate measurements, are used to plan future actions that may be needed to reduce Ra-226 exposure to current or future site occupants to levels that do not exceed the applicable regulatory requirement. It is important to note that destructive testing is not generally performed as described within TI 2800/043.

2.0 PROPERTY DESCRIPTION AND INITIAL SITE VISIT CONSIDERATIONS

2.1 Property Description and History

The site summary included in the "Historical Non-Military Radium Sites Research Effort Addendum" report (ORNL 2015) provides known site details about the type, form, history, potential locations, and other information related to discrete sources of Ra-226 used at the site. The Radium Dye Company, a facility that used Ra-226 in their products, was located at 318 and 314 West 10th Street in Kansas City, Missouri. Advertisements from 1914 and 1918 mention radium products produced by the Radium Dye Company. These include Radium A.B.C., a brown cleaner and color restorer, radium soap, and radium gas settler. The advertisement lists the address for the company as 318 W. 10th Street. Today, the building at 318/314 W. 10th Street (the same building has two numbers on it) is known as the Adler

Building. In 2005, the International Association of Assessing Officers (IAAO) moved their headquarters to the Adler Building (ORNL 2015). It is a brick building that contains three floors plus a basement. The building is approximately 1,300 square meters in area. The building is used for office space and storage. In general, the outer walls are red brick and the inner walls are drywall. The basement houses a library and storage area. The library is currently being remodeled. One area in the basement was locked making it inaccessible. The floor of the basement is either carpet or speckled 12" tile. The first and second floors are used as office space. The floors on the north side appear to contain the original wood while the south side appears newer (wider wooden slats). The third floor houses a conference room, kitchen/breakroom, and storage area. The floors appear to be original wood in the conference room, but the kitchen has carpet and tile while the storage room has plywood. The storage room is currently undergoing remodeling

The building is surrounded by concrete and asphalt sidewalks and driveways. A small patch with grass and plants is located in front of the building by the street. According to Guardian Restoration & Weatherproofing Contractors, Inc., the facility underwent renovations in February 2005 that involved extensive masonry restorations, including removal of multiple coats of paint from the exterior, removal and resetting of the clay cap, and painting of the metal cornice. The interior brick was cleaned and sealed after the plaster was removed (Guardian 2006).

As of November 2015, no information about radium contamination or radium cleanup was identified in the public records that were reviewed (ORNL 2015).

Figure 1. Approximate location of the former Radium Dye Company (Google Earth, 2017)

2.2 Initial Site Visit Considerations

Prior to commencing surveys, the general layout of the building was examined for consistency with historical information, to identify impediments to conducting the survey, and to consider potential health and safety issues. The four-story building is the original facility; however, it has undergone renovations. The structural integrity is sound. Much of the floor space is open, allowing the inspectors access to the floor for surveying. The land surrounding the building is comprised mostly of concrete and asphalt, limiting the area in which soil surveys could be performed. The north alley and east side of the building had limited lighting and were not surveyed.

3.0 SITE OBSERVATIONS AND FINDINGS

3.1 Summary of Activities

The inspection team conducted an initial site visit at the 318/314 West 10th Street property on February 23-24, 2017. A pre-inspection meeting was held with Jack Giessner and Daniel Strohmeyer from the NRC, Kaitlin Engel from ORAU, Ronald Worth and Ashley Lathrop from IAAO, and Amy Roberts from the Kansas City, Missouri, Health Department. The inspection team was granted access to all portions of the property except for a locked area in the basement.

Radiological surveys performed by the inspection team consisted of gamma radiation scans within the building using a Ludlum model 44-10 2-inch by 2-inch (2×2) sodium iodide detector connected to a Ludlum model 2221 ratemeter/scaler and exposure rate measurements using a Ludlum model 192 microRoentgen (μR[1]) ratemeter. The 2×2 sodium iodide detector gamma radiation measurements were collected near the surface, and the exposure rate readings were collected at approximately 3 feet (1 meter) from the surface being assessed. The inspection team surveyed the basement, three office floors, and the south and west sides of the building including a grassy area to the west of the building. Table 1 presents the specific instruments used during the initial site visit.

Table 1. Radium Dye Company Survey Instruments

Radiation Type (units)	Detector Type	Detector (Number)	Ratemeter (Number)
Alpha plus beta (cpm)	Plastic Scintillator	44-142 (688)	2221 (693)
Gross gamma (cpm)	Sodium Iodide	44-10 (1151)	2221 (693)
Gross gamma (μR/h)	Exposure Ratemeter	192 (1128)	N/A
Gamma Spectrum Analyzer (SAM-940)	Lanthanum Bromide	940 (864)	N/A

N/A = not applicable; ratemeter is not required
Number = equipment tracking number
cpm = counts per minute
μR/h = microRoentgen per hour

[1] Roentgen is a unit of exposure (energy absorbed in air), whereas a rem is a unit of dose delivered to a person (resulting from the radiation energy absorbed in that person). While Roentgen and rem are related, these are different units. Because they are similar for gamma ray energies from Ra-226, NRC makes the simplifying assumption in this case that these units are equivalent (1 Roentgen = 1 rem).

3.2 Summary of Results

The Appendix presents a summary of the results from the February 23-24, 2017, 318/314 W. 10th Street site visit.

In general, the 2×2 sodium iodide detector responses ranged from 5,000 to 15,000 counts per minute (cpm) inside the building. Gamma radiation levels varied based on proximity with materials known to contain naturally occurring radioactive material (NORM)—i.e., red bricks. Exposure rates varied similarly depending on proximity to NORM inside the building, with a consistent range from 5 to 14 microRoentgen per hour (μR/h) at 1 meter. These results are expected for NORM in this configuration. No discrete areas of elevated radiation were encountered inside the building and no locations were selected for direct measurements or smears.

For the outside area, the 2×2 sodium iodide detector responses ranged from 10,000 to 14,000 cpm and included the south and west sides of the building exterior and a small grassy area to the west of the building. Exposure rates ranged from 9 to 10 μR/h at 1 meter. The west side of the building is composed of a gray brick material that had higher gamma responses than the red brick ranging from 18,000 to 22,000 cpm and 18 to 20 μR/h. This was consistent for the entire west face of the building exterior. No discrete areas of elevated radiation were encountered outside the building.

Approximately 70 percent of the areas inside the building and 25 percent of the area outside the building were surveyed using the 2×2 sodium iodide detector and exposure ratemeter.

3.3 Summary of Dose Assessment Results

Because no radiation levels were detected above background, other than those due to presence of NORM, and no discrete sources of radium were encountered, a dose attributed to discrete radium sources could not be calculated.

4.0 OBSERVATIONS AND RECOMMENDATIONS

There was no indication from the areas surveyed that the 318/314 W. 10th Street property, formerly the Radium Dye Company, contains discrete sources of Ra-226 as determined by the following observations:

- Gamma radiation levels were consistent with background, as discussed above.
- The absence of observable gamma radiation anomalies is indicative that there are no discrete sources of Ra-226 present.
- Risk of potential contamination on the site is low due to the history of the site and its redevelopment.

Therefore, the recommendation to the NRC staff is that a more detailed scoping survey is not necessary at this time and NRC staff should not pursue additional action at the 318/314 W. 10th Street property.

5.0 REFERENCES

NRC 2016. *Inspection of Facilities Potentially Contaminated with Discrete Radium-226 Sources*, Temporary Instruction 2800/043, U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, D.C., October. (Agencywide Documents Access and Management System [ADAMS] Accession No. ML16035A053).

ORNL 2015. *Historical Non-Military Radium Sites Research Effort Addendum*, "Radium Dye Company: Site Summary," Pages 114-118, Oak Ridge National Laboratory, Oak Ridge, Tennessee, November 24 (ADAMS Accession No. ML16291A488).

Guardian 2006. Guardian Restoration & Weatherproofing Contractors, Inc. Wichita, Kansas, Spring. http://www.restoration-waterproof.com/Portals/0/Images/7679%20RWC%20NL_Spring%2006.pdf.

APPENDIX

SUMMARY OF SURVEY RESULTS FROM THE 318/314 WEST 10th STREET SITE VISIT

Site: Radium Dye Co.	Area: IAAO, Outside Area	Date(s): 02/24/2017	Time: 1935/1948
Surveyor(s): KME		Purpose: Site Visit	

Radiation Type	Instrument	Detector	Background
Gamma	2221: No.693	44-10: No.1151	10 - 22 kcpm[a]
Gamma	192: No.1128	NA	9 - 20 µR/h[a]

[a]Background varied depending on naturally occurring radioactive material in the area (i.e., red or gray brick).

Location	cpm	µR/h
1	22,000	20
2	10,000	10
3	13,000	9
4	18,000	18
5	11,000	10
6	11,000	10
7	13,000	10
8	12,000	10
9	14,000	10

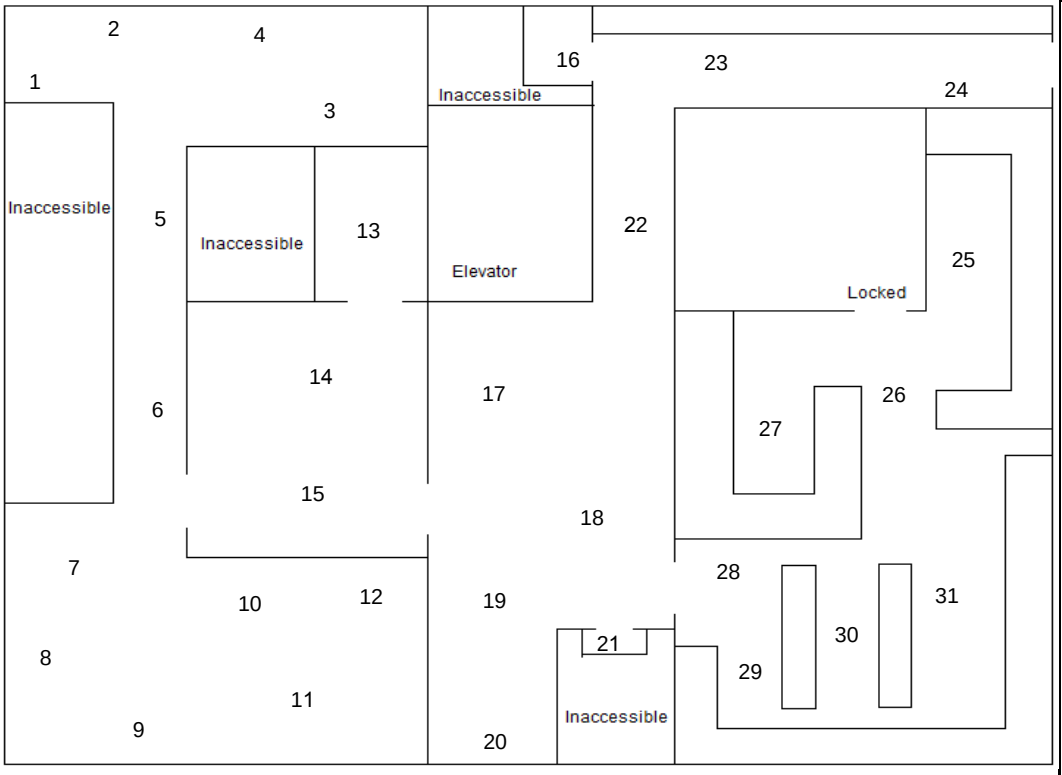
N

= measurement location number
See table for measurement

Site: Radium Dye Co.	Area: IAAO, Basement	Date(s): 02/23/2017	Time: 1900/1947
Surveyor(s): KME		Purpose: Site Visit	

Radiation Type	Instrument	Detector	Background
Gamma	2221: No.693	44-10: No.1151	7 - 11 kcpm[a]
Gamma	192: No.1128	NA	5 - 10 µR/h[a]

[a]Background varied depending on naturally occurring radioactive material in the area (i.e., red brick).



N

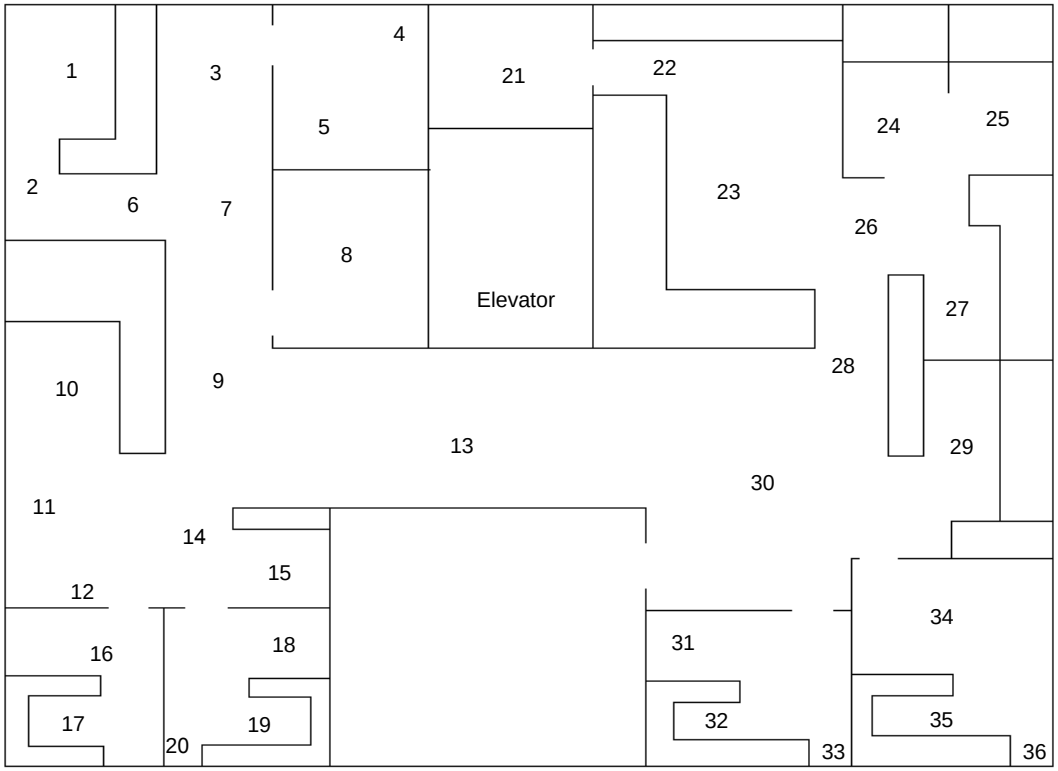
= measurement location number
See table for measurement

Location	cpm	µR/h
1	9,000	6
2	8,000	6
3	7,800	7
4	8,000	7
5	8,800	7
6	7,800	6.5
7	8,600	6
8	10,000	9
9	10,200	10
10	10,000	8
11	8,600	8
12	9,500	8
13	8,000	7
14	8,500	7
15	9,300	8
16	7,500	8
17	9,700	9
18	9,000	8
19	8,800	7
20	8,000	7
21	7,600	8
22	9,300	8
23	9,500	10
24	8,500	6
25	10,000	7.5
26	9,800	7
27	9,000	7
28	8,500	6
29	7,500	5.5
30	8,000	6.5
31	8,000	7

Site: Radium Dye Co.	**Area:** IAAO, First Floor	**Date(s):** 02/23/2017	**Time:** 1951/2035
Surveyor(s): KME		**Purpose:** Site Visit	

Radiation Type	Instrument	Detector	Background
Gamma	2221: No.693	44-10: No.1151	6 - 15 kcpm[a]
Gamma	192: No.1128	NA	5 - 14 µR/h[a]

[a]Background varied depending on naturally occurring radioactive material in the area (i.e., red brick).



N

= measurement location number
See table for measurement

Location	cpm	µR/h
1	10,000	10
2	12,000	13
3	10,000	9
4	15,000	14
5	8,000	7
6	8,000	6
7	8,000	6
8	7,000	5
9	7,800	7
10	9,000	7
11	10,500	10
12	9,000	8
13	7,000	5
14	8,200	7.5
15	6,500	5
16	9,000	8
17	11,000	10
18	7,000	7
19	8,000	7
20	10,000	8
21	7,800	8
22	8,000	8
23	7,000	7
24	8,500	8
25	9,300	10
26	6,500	7
27	8,500	7
28	7,300	6
29	9,000	7
30	7,000	5
31	6,500	6
32	7,000	6
33	10,000	7
34	8,300	6
35	8,900	8
36	11,000	10

Site: Radium Dye Co.	Area: IAAO, Second Floor	Date(s): 02/24/2017	Time: 1745/1840
Surveyor(s): KME		Purpose: Site Visit	

Radiation Type	Instrument	Detector	Background
Gamma	2221: No.693	44-10: No.1151	6 - 14 kcpm[a]
Gamma	192: No.1128	NA	5 - 13 µR/h[a]

[a]Background varied depending on naturally occurring radioactive material in the area (i.e., red brick).

N

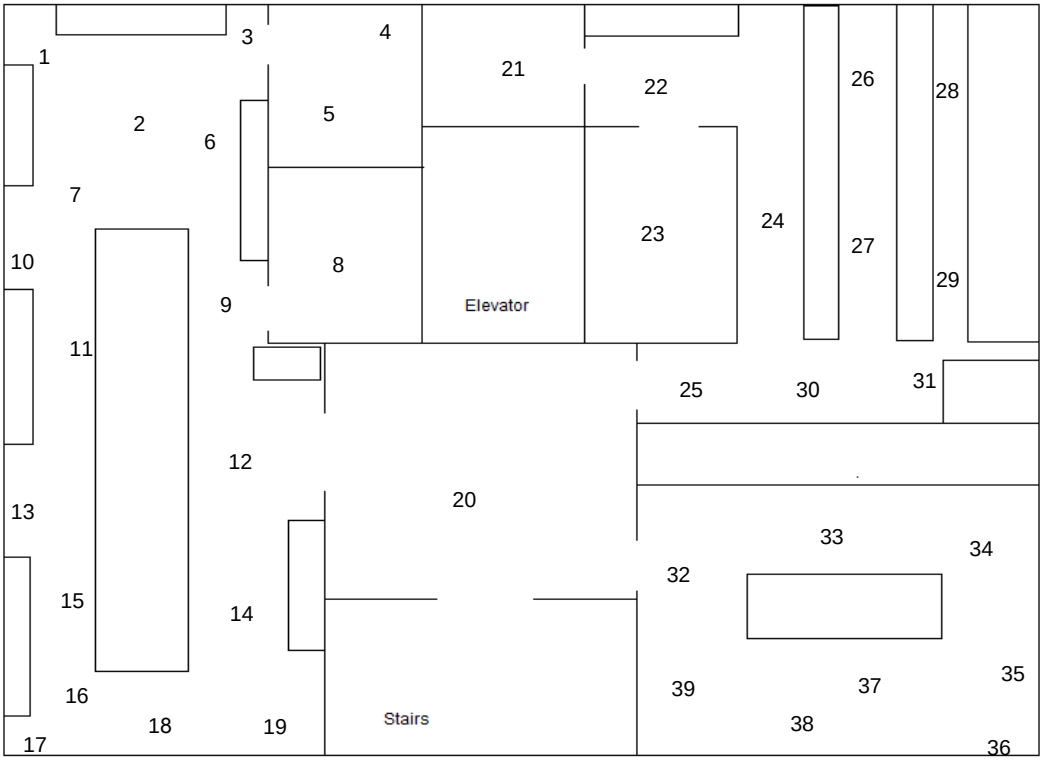
= measurement location number
See table for measurement

Location	cpm	µR/h
1	10,500	10
2	12,000	11
3	12,500	13
4	9,000	9
5	10,000	9
6	9,000	8
7	7,000	7
8	8,500	7
9	10,000	8
10	9,000	8
11	7,800	6
12	6,000	6
13	9,500	9
14	11,000	13
15	6,000	6
16	8,000	8
17	10,000	8
18	7,500	6.5
19	6,500	5
20	6,000	5
21	8,000	7
22	9,000	7
23	9,000	9
24	10,000	10
25	8,000	6
26	8,500	7
27	9,500	8
28	7,500	6
29	9,500	8
30	7,000	6
31	9,000	7
32	7,000	7
33	9,000	9
34	8,000	9
35	10,000	8
36	14,000	12

Site: Radium Dye Co.	**Area:** IAAO, Third Floor	**Date(s):** 02/24/2017	**Time:** 1850/1925
Surveyor(s): KME		**Purpose:** Site Visit	

Radiation Type	Instrument	Detector	Background
Gamma	2221: No.693	44-10: No.1151	5 - 14 kcpm[a]
Gamma	192: No.1128	NA	5 - 13 µR/h[a]

[a]Background varied depending on naturally occurring radioactive material in the area (i.e., red brick).



N

= measurement location number
See table for measurement

Location	cpm	µR/h
1	13,000	10
2	9,000	8
3	12,000	13
4	12,000	11
5	9,000	8
6	10,000	10
7	10,000	9
8	6,500	6
9	8,000	7
10	10,200	10
11	9,000	8
12	7,000	7
13	10,000	10
14	7,500	8
15	8,500	8
16	9,700	9
17	14,000	13
18	11,000	9
19	11,000	9
20	5,500	5
21	7,500	7
22	9,000	7
23	6,500	6
24	6,500	6
25	6,000	5
26	9,000	8
27	6,000	7
28	10,000	8
29	8,000	8
30	7,000	7
31	11,000	9
32	5,000	5
33	7,000	6
34	11,500	7
35	12,000	11
36	14,000	13
37	9,000	9
38	9,000	8
39	8,000	8

SUBJECT: RADIUM DYE COMPANY—RESULTS AND CONCLUSIONS OF THE U.S. NUCLEAR REGULATORY COMMISSION'S INITIAL SITE VISIT

DISTRIBUTION:
RidsRgn3MailCenter M. Kunowski, RIII B. Lin, RIII J. Whited, NMSS

ADAMS Accession No.: ML17069A458 ***via e-mail**

OFFICE	DUWP/MDB/PM	DUWP/LA	DUWP/PAB	DUWP/MDB
NAME	JWhited	CHolston	ASchwartzman*	GChapman*
DATE	03/15/2017	03/15/2017	03/23/2017	03/27/2017
OFFICE	RIII/DNMS/BC	DUWP/MDB/BC (A)	OGC (NLO)	DUWP
NAME	MKunowski*	TSmith	AWase*	JTappert
DATE	04/04/2017	04/28/2017	05/11/2017	05/19/2017

OFFICIAL RECORD COPY