



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

July 7, 2017

Mr. Gil Barish, President
Geodetic Designs, Inc.
2300 North Grand River Avenue
Lansing, Michigan 48906-3912

SUBJECT: HANGERMATES, LLC—RESULTS AND CONCLUSIONS OF THE U.S.
NUCLEAR REGULATORY COMMISSION'S INITIAL SITE VISIT

Dear Mr. Barish:

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 2300 North Grand River Avenue, Lansing, Michigan, performed on March 29, 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, the property at 2300 North Grand River Avenue in Lansing, Michigan was formerly occupied by Hangermates, LLC, an aircraft flight instrument repair company that began operations in 1996 and may have repaired luminous radium-226 (Ra-226) gauges at that property before closing sometime later. The initial site visit focused on the accessible areas within the building to identify any discrete Ra-226 sources.

As discussed within the enclosed site status report, NRC staff and NRC contractor staff from the Oak Ridge Associated Universities performed radiological surveys consisting of gamma radiation scans and exposure rate measurements. Surveys were conducted on accessible areas of the property, covering approximately 75 percent of the areas inside and 50 percent of the areas outside the building within property boundaries. 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.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 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,

/AKock for/

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

Docket No.: 03038955

Enclosure:
Site Status Report for Hangermates, LLC (2300 North Grand River Avenue)

REGISTERED LETTER – RETURN RECEIPT REQUESTED

Enclosure

OAK RIDGE ASSOCIATED UNIVERSITIES:

**SITE STATUS REPORT FOR HANGERMATES, LLC, AT
2300 NORTH GRAND RIVER AVENUE, LANSING, MICHIGAN**

July 7, 2017

EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) requested that the Oak Ridge Associated Universities (ORAU) perform a radiation survey of the property at 2300 North Grand River Avenue in Lansing, Michigan. This property was formerly occupied by Hangermates, LLC, an aircraft flight instrument repair company established in 1996, which possibly serviced vintage gauges containing radium. The objective of this survey was to locate possible discrete sources of radium, if any, that would be associated with prior Hangermates operations.

ORAU performed the radiation survey on March 29, 2017, and did not identify elevated levels of radiation. Because no elevated levels of radiation were identified, ORAU concluded that discrete sources of radium are not present in the building or surrounding surface soils. Based on these results, it is recommended that the NRC not pursue additional action at the 2300 North Grand River Avenue property.

SITE STATUS REPORT

Property: Hangermates, LLC
2300 North Grand River Avenue
Lansing, MI 48906

Docket Number: 03038955

Current Property Name: Geodetic Designs

Current Property Owner: 2300 North Grand River LLC

Inspection Dates: March 29, 2017

Inspector(s): Christine Lipa/NRC and Matthew Learn/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 Oak Ridge National Laboratory's (ORNL) review of historical information has identified Ra-226 use. The property at 2300 North Grand River Avenue in Lansing, Michigan (MI) was formerly occupied by Hangermates, LLC, an aircraft flight instrument repair company that began operations in 1996 and may have repaired luminous radium gauges (ORNL 2015). The objectives of the initial site visit were to determine if discrete sources of Ra-226 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 March 29, 2017, site visit, which included 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. Hangermates, LLC was founded in 1996 as a repair facility for aircraft flight instruments, which possibly serviced vintage gauges containing radium. It is unknown when Hangermates was closed; the original building is currently occupied by another company. Due to historic documentation of luminous radium usage in vintage aircraft gauges, it is suspected that radium contamination could be present in the buildings used to repair these instruments. The historical

record does not include information describing the location and magnitude of Ra-226 activity, if any, at the property (ORNL 2015).

A sign above the garage that was installed, prior to occupation by Geodetic Designs, suggests the building was built in 1960. The west side of the building is a single story, while the east side of the building contains two stories. The lower level of the entire building is occupied by Geodetic Designs and is used as office space or equipment storage. The second level is a vacant apartment. The walls of the building are brick or painted cement blocks, including interior walls. Walls in office spaces have faux wood paneling installed over the cement blocks. The flooring is concrete in the garage and carpeting in the office spaces. In the apartment, the carpeting has been removed. Roughly 75 percent of the floors were accessible for radiological surveys—access was limited over the remainder of the floor by office or land surveying equipment.

The land area immediately surrounding the building is grass bordered by gravel or asphalt. Figure 1 provides an aerial view of the former Hangermates property. Figure 2 provides a layout of the floorplan of the building.



Figure 1. Former Hangermates Property, Building Outlined in Red

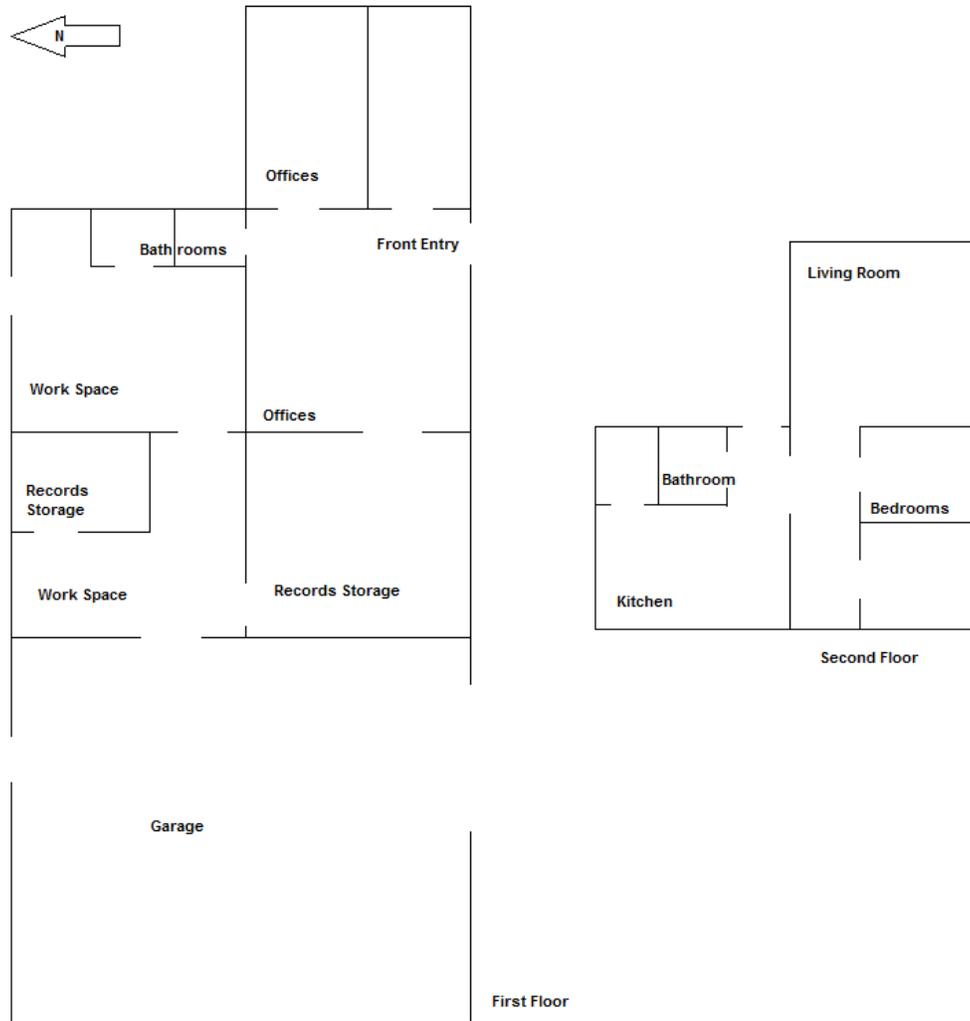


Figure 2. Layout of Geodetic Designs Building

2.2 Initial Site Visit Considerations

Prior to commencing survey activities, the general building layout was examined for consistency with historical information and to identify impediments to conducting the survey and/or health and safety considerations. Based on the history of the property, if Ra-226 contamination is present, it would likely be inside the building, in areas where aircraft gauges were repaired. Therefore, the initial site visit focused on identifying elevated radiation levels inside the building structure. An estimated 75 percent of the indoor space was available for survey.

3.0 SITE OBSERVATIONS AND FINDINGS

3.1 Summary of Activities

The inspection team conducted an initial site visit at the 2300 North Grand River Avenue property on March 29, 2017. During the site visit, a pre-inspection meeting was held with Christine Lipa/NRC, Matthew Learn/NRC, Rene France/Ingham County Environmental Health Department, Gil Barish/Geodetic Designs, and Kaitlin Engel/ORAU. Participants discussed the

inspection team's intention to perform general area surveys inside of the property, as time allowed.

Radiological surveys performed by the inspection team consisted of gamma radiation scans within the building and over the outdoor land area using a Ludlum model 44-10 2-inch by 2-inch (2x2) sodium iodide detector connected to a Ludlum model 2221 ratemeter/scaler and radiation exposure rate measurements using a Ludlum model 192 NaI-based microRoentgen (μR) ratemeter.¹ A Ludlum model 44-142 plastic scintillator connected to a Ludlum model 2221 ratemeter/scaler was available for direct surface activity measurements, if required. A SAM-940 gamma spectrum analyzer was available to perform field gamma spectrum measurements. Table 1 presents the specific instruments used.

Radiation Type (units)	Detector Type	Detector Model (Number)	Ratemeter (Number)
Alpha plus beta (cpm)	Plastic Scintillator ^a	44-142 (690)	2221 (602)
Gross gamma (cpm)	Sodium Iodide	44-10 (1151)	2221 (693)
Gross gamma exposure rate meter ($\mu\text{R}/\text{h}$)	Sodium Iodide	192 (1128)	N/A
Gamma Spectrum Analyzer (SAM-940)	Lanthanum Bromide	940 (40272) ^b	N/A

N/A = not applicable

Number = ORAU equipment barcode

cpm = counts per minute

$\mu\text{R}/\text{h}$ = microRoentgen per hour

^aThough traditionally used as a beta radiation detector, ORAU has calibrated the detector for measuring both alpha and beta radiation.

^bDevice performs automatic calibration upon startup and is source checked before use.

Surveys included gamma radiation scans using the 2x2 sodium iodide detector and exposure meter. All accessible floors and shelving inside the building were surveyed, covering an estimated 75 percent of the building. No direct measurements or smears were collected.

Surveys continued in the land area outside of the building. Surveys included gamma radiation scans using the 2x2 sodium iodide detector and exposure rate meter. Outdoor surveys included a single pass around the entire building perimeter, across grassy areas, and along the fence line, resulting in an estimated 50 percent land area coverage.

3.2 Summary of Results

Appendix A presents maps and tables containing the radiological survey data generated during the site visit. In the building, the 2x2 sodium iodide detector background responses ranged from 7,500 to 19,000 cpm. Gamma radiation levels varied based on proximity to materials known to contain naturally occurring radioactive material (NORM) (i.e., bricks and cement

¹Roentgen 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).

blocks). Background exposure rates ranged from 8 to 18 $\mu\text{R}/\text{h}$ at 1 meter above the ground surface. All surfaces of the northeast wall—both the upper and lower levels, and interior and exterior wall surface—were noted as exhibiting higher gamma radiation levels (approximately 2,000 to 5,000 cpm higher) as compared to the other building walls. This result is consistent with NORM-containing materials of construction as opposed to discrete Ra-226 contamination. No discrete areas of elevated radiation were encountered in the building.

In the land area outside the building, the 2x2 sodium iodide detector background responses ranged from 5,000 to 18,000 cpm. Gamma radiation levels varied based on proximity with materials known to contain NORM (i.e., bricks). Exposure background rates ranged from 4 to 17 $\mu\text{R}/\text{h}$ at 1 meter above the ground surface. As noted inside the building, the entire northeast wall had higher radiation levels compared to other walls of the building.

3.3 Summary of Dose Assessment Results

Because no radiation levels were detected above background, other than what was attributed to the presence of NORM, and no discrete sources of radium were identified, 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 2300 North Grand River Avenue property, formerly Hangermates, LLC, 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.

Based on the above observations, it is recommended that the NRC not perform a more detailed scoping survey at the former Hangermates, LLC property. The rationale is that the initial site visit already generated a robust dataset that meets the scoping survey purpose. Additionally, the recommendation is that the NRC staff should not pursue additional action at the former Hangermates property because no elevated radiation levels (relative to background) were identified.

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).

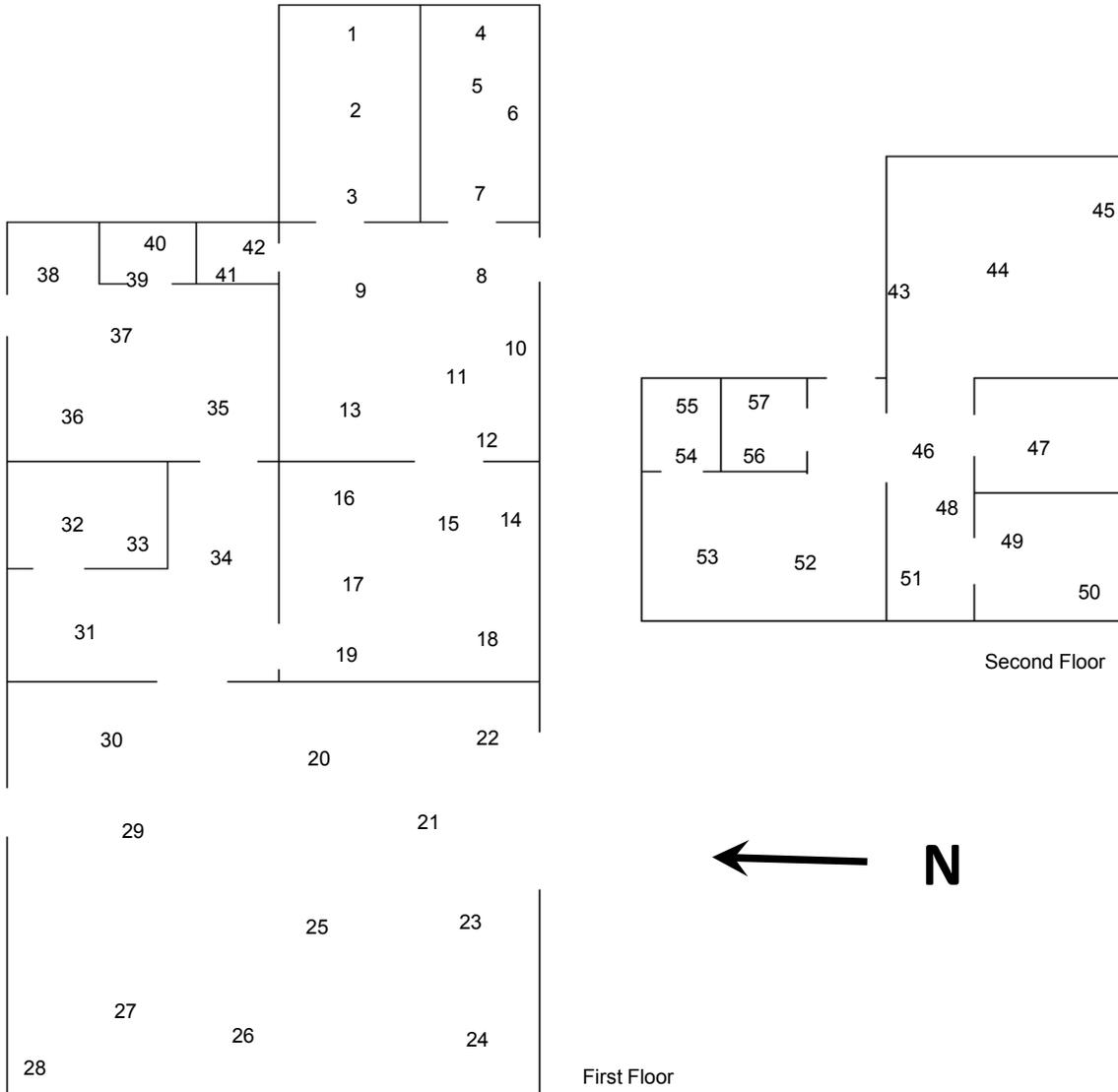
ORNL 2015. *Historical Non-Military Radium Sites Research Effort Addendum*, "Hangermates, LLC: Site Summary," Pgs. 56-59, Oak Ridge National Laboratory, Oak Ridge, Tennessee, November 24. (ADAMS Accession No. ML16291A488).

APPENDIX A

SURVEY MAPS AND DATA TABLES

Site: Hangermates	Area: Inside Building	Date(s): 03/29/2017	Time: 10:20/12:00
Surveyor(s): KME		Purpose: Site Visit	
Radiation Type	Instrument	Detector	Background
Gamma	2221 No. 693	44-10 No.1151	7 - 19 kcpm ^a
Gamma	192 No.1128	NA	8 - 18 μ R/h ^a

^aBackground varied depending on naturally occurring radioactive material in the area.

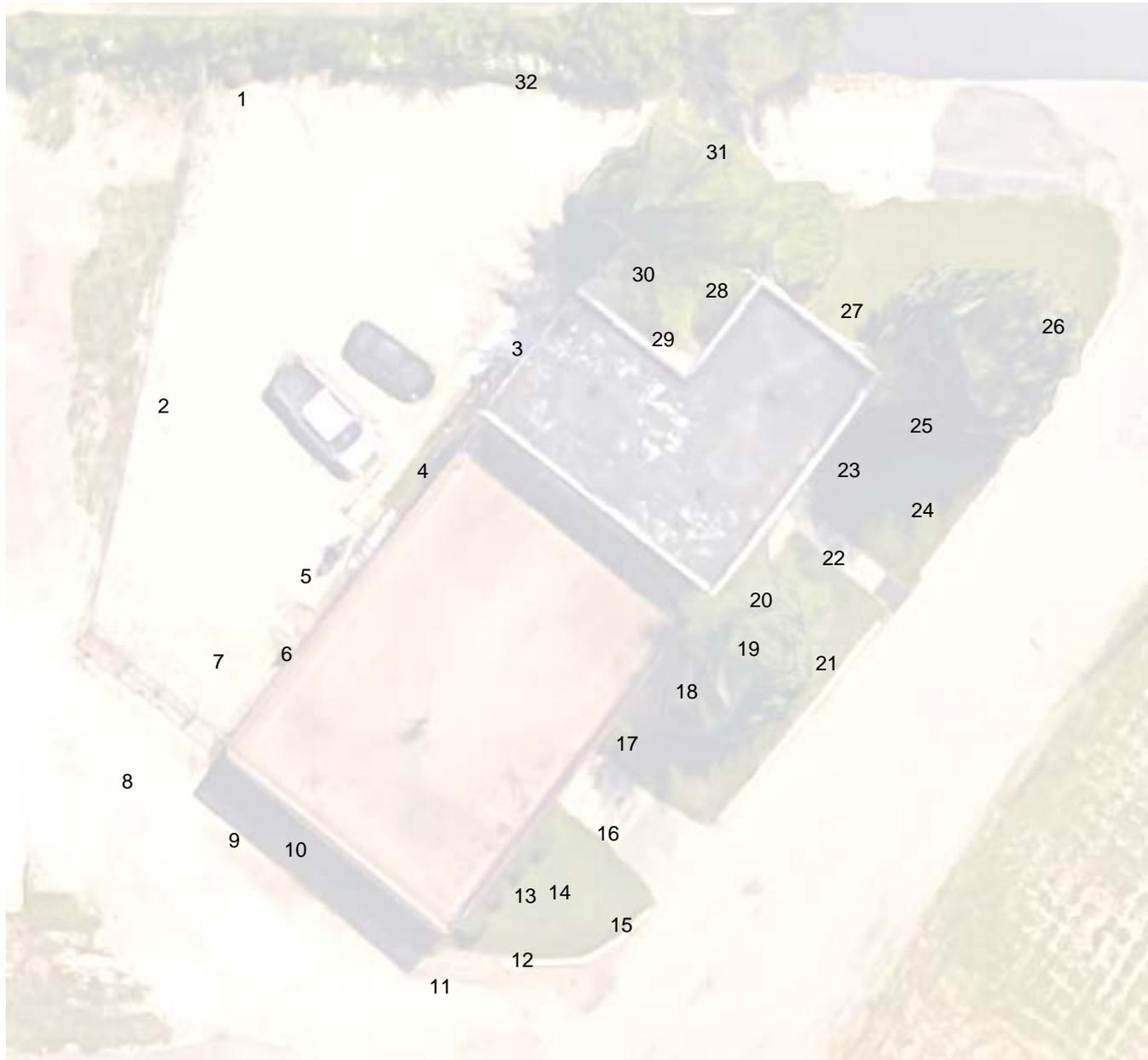


= measurement location number
See attached table for measurement results

Site: Hangermates	Area: Land Area	Date(s): 03/29/2017	Time: 10:20/12:00
Surveyor(s): KME		Purpose: Site Visit	

Radiation Type	Instrument	Detector	Background
Gamma	2221 No. 693	44-10 No.1151	7 - 19 kcpm ^a
Gamma	192 No.1128	NA	8 - 18 μ R/h ^a

^aBackground varied depending on naturally occurring radioactive material in the area.



= measurement location number
See attached table for measurement results



Table A-1. Hangermates Inside Building				
Location No.	Gamma ^a			Comments
	Contact		1 m	
	cpm	μR/hr	μR/hr	
1	13,000	—	12	
2	13,000	—	13	
3	15,000	—	14	
4	14,000	—	14	
5	12,500	—	12	
6	13,000	—	10	
7	15,000	—	14	
8	12,000	—	11	
9	11,000	—	10	
10	14,000	—	11	
11	11,000	—	9	
12	13,000	—	13	
13	11,000	—	11	
14	13,000	—	10	
15	8,000	—	8	
16	12,000	—	11	
17	8,000	—	9	
18	8,500	—	9	
19	9,000	—	9	
20	7,500	—	8	
21	9,000	—	9	
22	14,000	—	13	
23	10,000	—	10	
24	12,000	—	11	
25	10,500	—	9	
26	11,000	—	9	
27	14,000	—	12	
28	13,000	—	11	
29	9,000	—	8	
30	9,000	—	8	
31	10,000	—	10	
32	13,000	—	13	
33	16,000	—	15	Brick walls
34	10,000	—	10	
35	12,000	—	10	
36	13,000	—	14	
37	12,000	—	11	
38	12,000	—	12	
39	15,000	—	16	
40	19,000	—	18	Entire wall elevated
41	15,000	—	16	
42	18,000	—	15	Entire wall elevated
43	15,000	—	13	
44	12,000	—	10	
45	13,000	—	12	
46	12,000	—	12	
47	12,000	—	10	
48	13,000	—	11	
49	10,500	—	10	

Table A-1. Hangermates Inside Building				
Location No.	Gamma ^a			Comments
	Contact		1 m	
	cpm	μR/hr	μR/hr	
50	11,000	—	10	
51	12,000	—	12	
52	11,000	—	10	
53	12,000	—	10	
54	14,000	—	13	
55	16,000	—	15	
56	12,000	—	14	
57	16,000	—	15	

a) Ludlum 44-10 NaI with Ludlum 2221 rate meter; Ludlum 192 NaI
— indicates measurement not collected at this location

Table A-2. Hangermates Land Area				
Location No.	Gamma ^a			Comments
	Contact		1 m	
	cpm	μR/hr	μR/hr	
1	5,000	—	5	
2	5,500	—	4	
3	10,000	—	10	
4	11,000	—	11	
5	6,000	—	7	
6	12,000	—	11	
7	9,000	—	9	
8	6,000	—	5	
9	10,000	—	8	
10	12,000	—	14	
11	11,500	—	10	
12	7,500	—	7	
13	13,000	—	12	
14	10,000	—	9	
15	8,000	—	6	
16	9,000	—	8	
17	13,000	—	11	
18	12,000	—	12	
19	11,000	—	10	
20	13,000	—	13	
21	7,000	—	7	
22	9,000	—	8	
23	14,000	—	13	
24	10,000	—	8	
25	11,000	—	9	
26	6,500	—	6	
27	10,000	—	8	
28	10,000	—	8	
29	18,000	—	17	Entire wall elevated
30	12,000	—	10	
31	8,500	—	7	
32	6,500	—	5	

a) Ludlum 44-10 NaI with Ludlum 2221 rate meter; Ludlum 192 NaI
— indicates measurement not collected at this location

SUBJECT: HANGERMATES, LLC—RESULTS AND CONCLUSIONS OF THE U.S.
NUCLEAR REGULATORY COMMISSION'S INITIAL SITE VISIT

DISTRIBUTION:

RidsRgn3MailCenter

M. Kunowski, RIII

B. Lin, RIII

M. Learn, RIII

ADAMS Accession No.: ML17114A397***via e-mail**

OFFICE	DUWP/MDB/PM	DUWP/LA	DUWP/MDB	DUWP/MDB
NAME	JWhited	CHolston	CGrossman*	GChapman*
DATE	04/26/2017	04/25/2017	05/01/2017	05/02/2017
OFFICE	RIII/DNMS/BC	DUWP/MDB/BC (A)	OGC (NLO)	DUWP
NAME	MKunowski*	TSmith	AWase*	JTappert (AKock for)
DATE	05/09/2017	05/12/2017	05/18/2017	07/07/2017

OFFICIAL RECORD COPY