October 31, 2012

Mr. Richard L. Holm
Reactor Administrator
216 Talbot Laboratory
104 South Wright St.
Urbana, IL 61801

SUBJECT: NRC INSPECTION REPORT 05000151/12005(DNMS) ─ UNIVERSITY OF ILLINOIS NUCLEAR REACTOR

Dear Mr. Holm:

On October 15, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection of the permanently shut down University of Illinois Advanced Teaching Research Isotope General Atomic (TRIGA) Nuclear Research Reactor, Urbana, Illinois. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with NRC requirements. Specifically, during an on-site inspection on July 23, 2012, and subsequent in-office review through October 15, 2012, the inspectors conducted independent confirmatory radiation surveys and sampling, and evaluated your contractor's decommissioning performance. At the conclusion of the on-site inspection, the inspectors discussed the interim inspection results with your decommissioning contractor. At the conclusion of the in-office review, a final telephone exit meeting was conducted with you on October 15, 2012.

This inspection consisted of an examination of decommissioning activities at the site as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection included the performance of confirmatory surveys and a selective examination of decommissioning documents.

Based on the results of this inspection, no violations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html.

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

/RA/

Christine A. Lipa, Chief
Materials Control, ISFSI, and
Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 050-00151
License No. R-115

Enclosure:
NRC Inspection Report No. 05000151/12005(DNMS)

cc w/encl: J. Klinger, Illinois Emergency Management Agency (IEMA)
K. Horn, IEMA
C. Settles, IEMA
L. Prussing, Mayor, City of Urbana
J. Stubbins, University of Illinois

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

/RA/

Christine A. Lipa, Chief
Materials Control, ISFSI, and
Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 050-00151
License No. R-115

Enclosure:
NRC Inspection Report No. 05000151/12005(DNMS)

cc w/encl: J. Klinger, Illinois Emergency Management Agency (IEMA)
K. Horn, IEMA
C. Settles, IEMA
L. Prussing, Mayor, City of Urbana
J. Stubbins, University of Illinois

DISTRIBUTION w/encl:
Bruce Watson
John Hickman
Cynthia Pederson
Anne Boland
Patrick Louden
Allan Barker
Harral Logaras
Carole Ariano
Linda Linn
MCID Branch

*see previous concurrence
ADAMS Acession Number: ML12307A330
DOCUMENT NAME: g:\dnmsiii\work in progress\ir u of il 2012005 r5 with christines input.docx
X Publicly Available □ Non-Publicly Available □ Sensitive X Non-Sensitive
To receive a copy of this document, indicate in the concurrence box "C" = Copy without attach/encl "E" = Copy with attach/encl "N" = No copy

OFFICE	RIII DNMS	E	RIII DNNMS	N	RIII DNNMS	N	RIII DNNMS	
NAME	GABonano GAB		LRodriguez LR		JTapp JET		CALipa CAL	
DATE	10/31/12		10/24/12		10/26/12		10/31/12	

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.	050-00151
License No.	R-115
Report Nos.	05000151/12005(DNMS)
Licensee:	University of Illinois
Facility:	TRIGA Nuclear Research Reactor
Location:	Urbana, Illinois
Dates:	July 23, 2012 (on-site) through October 15, 2012 (in-office review)
NRC Inspectors:	Gene Bonano, Health Physicist Lionel Rodriguez, Reactor Engineer
Observer:	Kelly Horn, Illinois Emergency Management Agency
Approved by:	Christine A. Lipa, Chief Materials Control, ISFSI, and Decommissioning Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY
University of Illinois – TRIGA Nuclear Reactor
Inspection Report 050000151/12005(DNMS)

The University of Illinois Advanced Teaching Research Isotope General Atomic (TRIGA) Nuclear Research Reactor was shut down in 1998 and has been maintained in a safe storage condition (SAFSTOR) since shutdown. In 2004, all spent fuel was shipped off site for permanent storage. In October 2011, active decommissioning work began which was conducted by a qualified decommissioning contractor; project policies, programs, and procedures were developed and approved. The licensee completed reactor building demolition activities in July 2012, and performed final status surveys of the remaining soil within the footprint of the former reactor building.

This decommissioning inspection included an assessment of the licensee's current performance related to decommissioning activities by reviewing final status surveys and performing independent confirmatory radiation surveys and sampling. The confirmatory surveys and the associated sampling were performed in and around the footprint of the former reactor building.

Inspection of Remedial and Final Surveys at Permanently Shutdown Reactors

- The results of the confirmatory surveys were consistent with the licensee's final status survey results and below the required cleanup levels, or derived concentration guideline levels (DCGLs). The licensee adequately classified the survey units and applied the correct DCGLs in accordance with the Final Status Survey Plan (FSSP). (Section 1.0)

Report Details

1.0 Inspection of Remedial and Final Surveys at Permanently Shutdown Reactors (83801)

1.1 Inspection Scope

On July 23, 2012, the inspectors performed confirmatory surveys and collected soil samples in the land areas in and around the footprint of the former University of Illinois Advanced TRIGA Nuclear Research Reactor building to determine if residual radioactivity in soil at the site was less than the U. S. Nuclear Regulatory Commission (NRC) approved DCGLs.

The inspectors performed a 100% gamma walkover survey of accessible areas of the Class 1 survey unit and about a 50% gamma walkover survey of the Class 2 survey unit. Walkover surveys were performed with Sodium Iodide (NaI) scintillation detectors and associated Global Positioning System (GPS) equipment to track and record the survey results (see Attachment 2).

The inspectors collected 23 soil samples inside the Class 1 survey unit, with two at biased locations where elevated readings were identified. The inspectors also took three soil samples in the Class 2 survey unit and two background soil samples in a non-impacted location outside the survey units; the soil sample locations were also recorded with the GPS equipment. All the samples were sent to the NRC's contractor for laboratory analysis, Oak Ridge Associated Universities (ORAU).

The inspectors reviewed the licensee's final status survey sample results for the Class 1 and 2 survey units, as well as the surveys for the remaining concrete pilings, former vault locations, and former pipe tunnel location to ensure compliance with the requirements of the licensee's FSSP.

1.2 Observations and Findings

The licensee and contractor completed all remedial activities, including reactor building demolition, and excavation of the building's footing and foundation. The licensee also completed their final status surveys in the two survey units, the remaining concrete pilings (footers), the former vault locations, and the former pipe tunnel location. The inspectors determined that the survey units were classified and surveyed in accordance with the requirements of the FSSP and per the guidance in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

The inspectors' walkover survey background readings ranged from approximately 5,000 to 11,000 counts per minute (cpm), depending on the surface of the area surveyed. The analytical results (in units of activity per unit mass concentrations) of the soil samples analyzed by ORAU were less than their reported minimum detectable concentrations, well below the approved DCGLs for each of the nuclides of concern listed in the FSSP; therefore, resulting in a sum of fractions less than unity. The results of the sample analysis were documented in a letter dated August 27, 2012 from ORAU to the NRC, with the subject, "Letter Report for Analytical Results for Twenty Eight Soil Samples from the University of Illinois Nuclear Reactor, Urbana, Illinois" (ML12248A052).

The NRC confirmatory walkover survey results were consistent with the licensee's final status survey results. During the performance of the NRC confirmatory surveys, the inspectors noted that there were two types of soils with different consistencies in the Class 1 and Class 2 survey units. One of the soils was a darker and richer soil which had a more elevated background reading when compared to the other type of soil which was lighter in color and more sand-like. The NRC confirmatory survey data showed that the darker soil had a background closer to 10,500 cpm with the NaI detector, while the lighter colored soil had a background closer to 8,500 cpm. The licensee's final status survey results do not take into account the two different types of soils with different backgrounds. However, as demonstrated by the licensee's final status survey soil sample results, the DCGL release criteria were met for the release of the two survey units. The licensee's final status survey soil sample results were also consistent with the NRC's confirmatory survey soil sample results. The inspectors also determined that the final status surveys for the remaining concrete pilings, former vault locations, and former pipe tunnel location met the DCGL release criteria as documented in the FSSP.

No findings of significance were identified.

1.3 Conclusions

The results of the confirmatory surveys were consistent with the licensee's final status survey results and below the required cleanup levels, or DCGLs. The licensee adequately classified the survey units and applied the correct DCGLs in accordance with the FSSP.

2.0 Exit Meeting Summary

The inspectors presented the inspection results to the licensee's contractor at the conclusion of the on-site inspection on July 23, 2012. After completion of an in-office review of the laboratory results, a final exit via telephone with Mr. Rich Holm was held on October 15, 2012. The licensee acknowledged the results presented and did not identify any of the documents reviewed by the inspectors as proprietary.

ATTACHMENTS
1. SUPPLEMENTAL INFORMATION
2. UNIVERSITY OF ILLINOIS RESEARCH
   REACTOR DECOMMISSIONING WALKOVER
   RADIOLOGICAL SURVEY URBANA, ILLINOIS

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Higgins, Project Radiation Safety Officer
R. Holm, Reactor Administrator

LIST OF PROCEDURES USED

IP 83801	Inspection of Remedial and Final Surveys at Permanently Shutdown Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	None
Closed	None
Discussed	None

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
cpm	counts per minute
DCGL	Derived Concentration Guideline Level
DNMS	Division of Nuclear Materials Safety
FSSP	Final Status Survey Plan
GPS	Global Positioning System
IEMA	Illinois Emergency Management Agency
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
NaI	Sodium Iodide
NRC	U. S. Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities
TRIGA	Teaching Research Isotope General Atomic

DOCUMENTS REVIEWED

Document No. 82A9581, Decommissioning Plan, Revision 1, dated March 2006

CS-RS-PN-003, Final Status Survey Plan (FSSP) for the Nuclear Research Laboratory University of Illinois, Revision 1

Final Status Survey, Class 1, dated July 20, 2012

Final Status Survey, Class 2, dated July 18, 2012

Final Status Survey, Underneath Tunnel (Soil), dated July 19, 2012

Final Status Survey, Footers and Vaults, dated July 19, 2012

Final Status Survey, Class 1 Soil Sample Results (FS-C1-01 through FS-C1-12), dated August 28, 2012

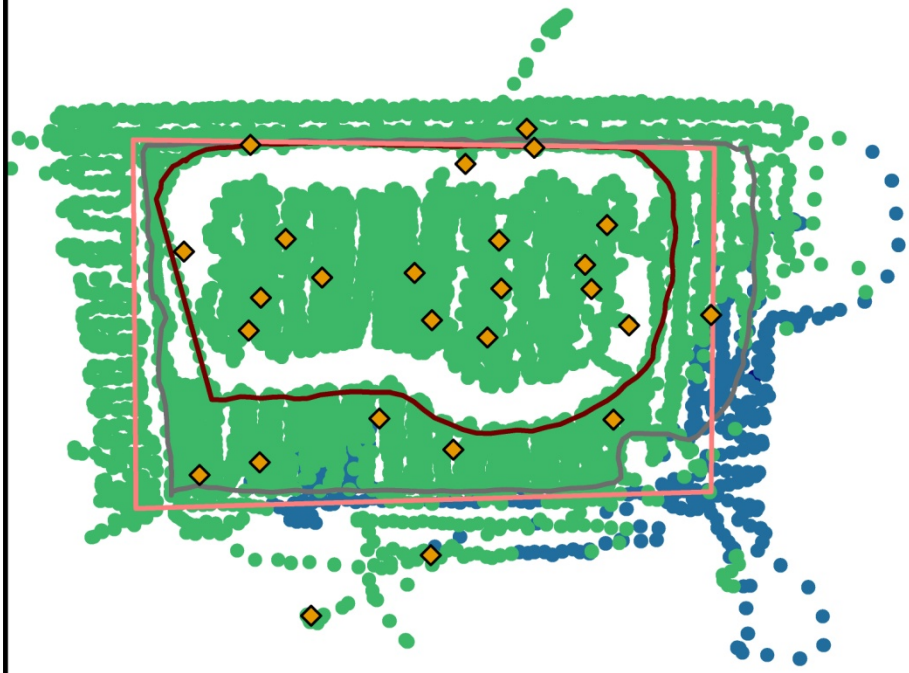
Final Status Survey, Class 1 Soil Sample Results (FS-C1-13 through FS-C1-32), dated August 27, 2012

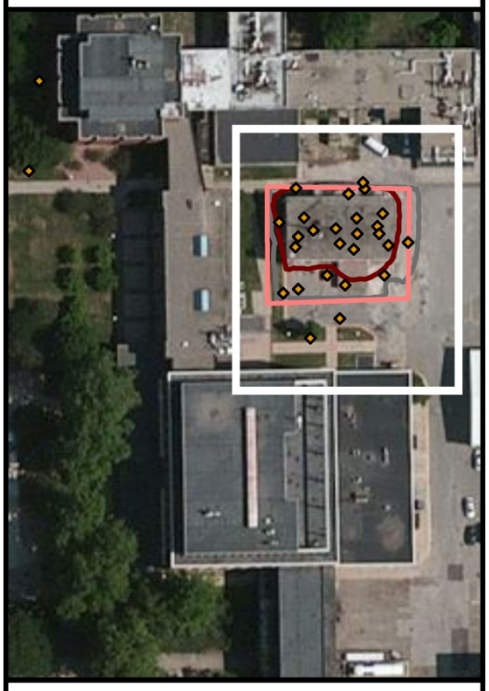
Final Status Survey, Class 1 Soil Sample Results (FS-C1-33 through FS-C1-52), dated August 28, 2012

Final Status Survey, Class 1 Soil Sample Results (FS-C1-53 through FS-C1-56), dated August 30, 2012

Final Status Survey, Class 2 Soil Sample Results (FS-C2-01 through FS-C2-20), dated August 27, 2012

Final Status Survey, Class 2 Soil Sample Results (FS-C2-21 through FS-C2-28), dated August 28, 2012





Sample Information*

NRC Sample (ID #)	Licensee (ID #)**	Counts (cpm)	Notes
UIL-12-1-01	N/A	10000	Background Sample Location 1
UIL-12-1-02	N/A	10000	Background Sample Location 2
UIL-12-1-03-B1	N/A	8200	Biased Sample Location 1 in Class 1 Area
UIL-12-1-04-B2	N/A	8300	Biased Sample Location 2 in Class 1 Area
UIL-12-1-05	N/A	8000	Non Biased Sample in Class 1 Area
UIL-12-1-06	27	8300	Non Biased Sample in Class 1 Area
UIL-12-1-07	33	7700	Non Biased Sample in Class 1 Area, Reactor Location
UIL-12-1-08	N/A	7800	Non Biased Sample in Class 1 Area, Piping Location
UIL-12-1-09	N/A	7900	Non Biased Sample in Class 1 Area, Conduit Location
UIL-12-1-10	N/A	7600	Non Biased Sample in Class 1 Area
UIL-12-1-11	N/A	8000	Non Biased Sample in Class 1 Area
UIL-12-1-12	N/A	8000	Non Biased Sample in Class 1 Area
UIL-12-1-13	N/A	8300	Non Biased Sample in Class 1 Area, Lab Location
UIL-12-1-14	37	8400	Non Biased Sample in Class 1 Area
UIL-12-1-15	N/A	8000	Non Biased Sample in Class 1 Area
UIL-12-1-16	N/A	8600	Non Biased Sample in Class 1 Area, RAM Storage Location
UIL-12-1-17	36	10400	Non Biased Sample in Class 1 Area
UIL-12-1-18	N/A	10000	Non Biased Sample in Class 1 Area
UIL-12-1-19	2	7700	Non Biased Sample in Class 1 Area
UIL-12-1-20	10	8300	Non Biased Sample in Class 1 Area
UIL-12-1-21	N/A	7500	Non Biased Sample in Class 1 Area
UIL-12-1-22	13	7300	Non Biased Sample in Class 1 Area
UIL-12-1-23	N/A	6500	Non Biased Sample in Class 1 Area
UIL-12-1-24	54	8700	Non Biased Sample in Class 1 Area
UIL-12-1-25	N/A	8200	Non Biased Sample in Class 1 Area
UIL-12-1-26	N/A	8400	Non Biased Sample in Class 2 Area
UIL-12-1-27	N/A	8100	Non Biased Sample in Class 2 Area
UIL-12-1-28	N/A	11200	Non Biased Sample in Class 2 Area

* Please see the ORAU Report in ADAMS (ML12248A052) which contains the analytical results for the 28 NRC soil samples

** The NRC soil samples taken at licensee sample locations were taken after the licensee had collected their own soil samples and are not considered true split samples

Legend

Samples

- Sample Locations

Boundaries

- Perimeter of Excavation Area
- Perimeter of Fence
- Class 1 Area Estimate

Gamma Walkover (cpm)

- 4733
- 4734 - 6000
- 6001 - 12000
- 12001 - 18000
- 18001 - 24000

N

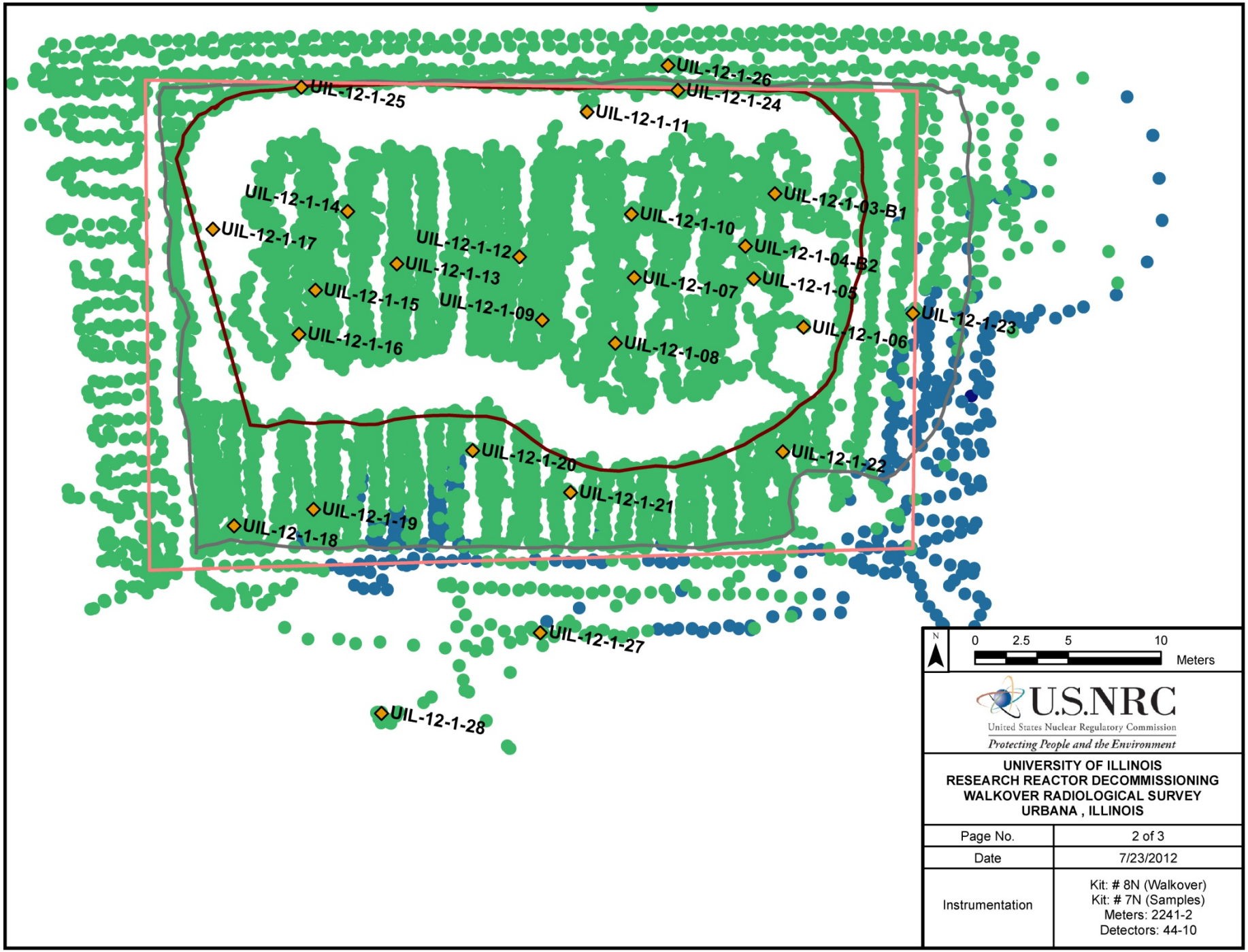
0 2.5 5 10 15 20 Meters

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

UNIVERSITY OF ILLINOIS
RESEARCH REACTOR DECOMMISSIONING
WALKOVER RADIOLOGICAL SURVEY
URBANA , ILLINOIS

Page No.	1 of 3
Date	7/23/2012
Instrumentation	Kit: # 8N (Walkover) Kit: # 7N (Samples) Meters: 2241-2 Detectors: 44-10

Attachment 2


UIL-12-1-26
UIL-12-1-25
UIL-12-1-24
UIL-12-1-11
UIL-12-1-14
UIL-12-1-03-B1
UIL-12-1-17
UIL-12-1-10
UIL-12-1-12
UIL-12-1-04-B2
UIL-12-1-13
UIL-12-1-07
UIL-12-1-05
UIL-12-1-15
UIL-12-1-09
UIL-12-1-23
UIL-12-1-16
UIL-12-1-06
UIL-12-1-08
UIL-12-1-20
UIL-12-1-22
UIL-12-1-21
UIL-12-1-19
UIL-12-1-18
UIL-12-1-27
UIL-12-1-28
N
0 2.5 5 10
Meters
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment
UNIVERSITY OF ILLINOIS
RESEARCH REACTOR DECOMMISSIONING
WALKOVER RADIOLOGICAL SURVEY
URBANA , ILLINOIS
Page No. 2 of 3
Date 7/23/2012
Instrumentation Kit: # 8N (Walkover)
Kit: # 7N (Samples)
Meters: 2241-2
Detectors: 44-10

N

0 2.5 5 10 15 20 25

Meters

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

UNIVERSITY OF ILLINOIS
RESEARCH REACTOR DECOMMISSIONING
WALKOVER RADIOLOGICAL SURVEY
URBANA , ILLINOIS

Page No.	3 of 3
Date	7/23/2012
Instrumentation	Kit: # 8N (Walkover) Kit: # 7N (Samples) Meters: 2241-2 Detectors: 44-10