International Isotopes Inc.

June 25, 2013

ATTN: Document Control Desk
Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Request to Amend License SUB-1587

International Isotopes Inc. (INIS) is no longer conducting research and development activities under U.S. Nuclear Regulatory Commission (NRC) License SUB-1587 and therefore requests to amend the license as follows:

Revise Block 9 to remove Building 1359 from an authorized location for use,

Revise Block 10 to limit authorized activities to possession and storage,

Revise Block 19 to remove the requirement to maintain as site security plan as there are no longer any toxic gases (i.e. GeF_4, BF_3) stored at the facility.

The following attachments are enclosed to support this request:

- Completed Form 313
- Blocks 5 through 11 NRC From 313
- 1359 Decommissioning Plan dated February 18, 2013
- 1359 Final Status Survey Report dated June 25, 2013

Please contact me at 208.524.5300 or via email at jjmiller@intisoid.com if you have any questions or comments regarding this request.

Sincerely,

John J. Miller, CHP
Radiation Safety Officer
JJM-2013-24
Enclosures as Stated

4137 Commerce Circle, Idaho Falls, Idaho 83401
Phone: 208-524-5300, 800-699-3108 Fax: 208-524-1411
Website: www.intisoid.com

NMSS01

Blocks 5 Through 11 NRC Form 313

5. RADIOACTIVE MATERIAL.

   a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

   No change requested.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

   Possession and Storage

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.

   No change requested

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

   No change requested

9. FACILITIES AND EQUIPMENT.

   Depleted uranium compounds and equipment contaminated with depleted uranium compounds will be stored at 4137 Commerce Circle Idaho Falls, ID 83401.

10. RADIATION SAFETY PROGRAM.

    No change requested

11. WASTE MANAGEMENT.

    No change requested

NRC FORM 313 **U.S. NUCLEAR REGULATORY COMMISSION**
(03-2013)
10 CFR 30, 32, 33, 34, 35, 36, 39, and 40

APPLICATION FOR MATERIALS LICENSE

APPROVED BY OMB: NO. 3150-0120 **EXPIRES: 05/31/2015**

Estimated burden per response to comply with this mandatory collection request: 4.3 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Information Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW. *AMENDMENTS/RENEWALS THAT INCREASE THE SCOPE OF THE EXISTING LICENSE TO A NEW OR HIGHER FEE CATEGORY WILL REQUIRE A FEE.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

OFFICE OF FEDERAL & STATE MATERIALS AND
ENVIRONMENTAL MANAGEMENT PROGRAMS
DIVISION OF MATERIALS SAFETY AND STATE AGREEMENTS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,

SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PA 19406-2713

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING,

SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
1600 E. LAMAR BOULEVARD
ARLINGTON, TX 76011-4511

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S.NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [x] B. AMENDMENT TO LICENSE NUMBER SUB-1587
- [ ] C. RENEWAL OF LICENSE NUMBER

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include ZIP code)*

International Isotopes Inc.
4137 Commerce Circle
Idaho Falls, ID 83401

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

4137 Commerce Circle
Idaho Falls, ID 83401

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

John J. Miller

BUSINESS TELEPHONE NUMBER	BUSINESS CELLULAR TELEPHONE NUMBER
(208) 524-5300	(208) 589-1580

BUSINESS EMAIL ADDRESS
jjmiller@intisoid.com

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSE FEES (Fees required only for new applications, with few exceptions*) *(See 10 CFR 170 and Section 170.31)*

FEE CATEGORY: 2.C. AMOUNT ENCLOSED $ 0.00

13. CERTIFICATION. *(Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.*

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35 , 36, 39, AND 40, AND THAT ALL INFORMATION CONTANED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.
WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A C RIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER – TYPED/PRINTED NAME AND TITLE	SIGNATURE	DATE
John J. Miller, CHP Radiation Safety Officer		06/25/2013

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			$		
APPROVED BY				DATE	

1359 Decommissioning Plan

International Isotopes, Inc.
1359 Commerce Way Facility
NRC License Number SUB-1587

February 18, 2013

Prepared By:	/s/ John Miller	2/18/2013
	John Miller CHP, Radiation Safety Officer, International Isotopes Inc.	Date
Reviewed By:	/s/ Carrie Wildman	2/18/2013
	Carrie Wildman, Project Manager International Isotopes Inc.	Date
Reviewed By:	/s/ Audrey Nelson	2/18/2013
	Audrey Nelson, Quality Assurance Manager International Isotopes Inc.	Date
Approved By:	/s/ Steve Laflin	2/18/2013
	Steve Laflin, President and C.E.O. International Isotopes Inc.	Date

1359 Decommissioning Plan

International Isotopes, Inc.
1359 Commerce Way Facility
NRC License Number SUB-1587

February 18, 2013

This 1359 Decommissioning Plan has been developed using guidance provided in NUREG-1575 Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) and NUREG-1757, Consolidated Decommissioning Guidance, Volumes 1 & 2.

Decommissioning of the International Isotopes Inc. Building 1359 facility is being conducted to support an Amendment to NRC License SUB-1587, to remove the Building 1359 facility from the license and to revise the license from Possession and Use to Possession and Storage. Depleted uranium and potentially contaminated equipment will be stored at the 4137 Commerce Circle facility warehouse until it is either disposed of as radioactive waste, released for unrestricted use or transferred to another license, such as SUB-1011 for future use.

Table of Contents

1.0 FACILITY BACKGROUND

Building History & Description

The 1359 facility is located in the St. Leon Business Park on the north side of Idaho Falls, Idaho. The building is constructed of expanded polymer block filled with approximately four inches of concrete. International Isotopes Inc. acquired the facility in February 2004. Prior to acquisition the facility was occupied by Alliance Contractors, a vinyl siding and window distributor. There is no reason to believe radioactive materials where introduced into this facility by the prior occupants.

The 1359 facility is equipped with its own septic system that currently serves the restrooms and floor drains located in the restrooms and utility closet.

The facility is approximately 80 feet wide by 100 feet deep Room numbers and functions are listed in the table below. Refer to the facility diagram enclosed with this plan.

Room	Function
101	Reception Area
102	Utility Hall Way
102A	Utility Closet
102B	Men's Restroom
102C	Women's Restroom
201	Second Floor Conference Room
301	Gas Production Skid
302	Analytical Laboratory
303	Count Room
304	Powder Handling (UF_4, U_3O_8, GeO_2, B_2O_3)
401	Process Floor Mezzanine
402	Count Room/DU Handling Room Mezzanine

Interior walls of the production area are constructed of steel siding. The production area floors are constructed of sealed concrete. There are no floor drains associated with the production area. Approximately 350 linear feet of ventilation ducting exists in the facility, only a small run of ducting has the potential for radiological contamination. Approximately 90% of the gas production system is located on a skid, which can be removed from the facility utilizing a fork lift.

The following list describes the major pieces of equipment that have been used in the radiological work and fluorine gas production processes equipment.

DUF4/DUOxide Stainless Steel Glove Box: A stainless steel glove box had been used to transfer batches of UF_4 into the reaction tray. This glove box was used very infrequently because small batch sizes did not require the use of the glove box.

DUF_4/DUOxide Plexiglas Glove Box: A small Plexiglas glove box has been utilized to transfer batches of UF_4 into the reaction tray. Low levels of residual depleted uranium are expected to be present in this glove box.

DUF_4/DUOxide Fume Hood: A small Plexiglas fume hood has been utilized to perform visual inspections of the reacted depleted uranium and GeO_2 or B_2O_3 following a batch run. Low levels of residual depleted uranium are expected to be present in this fume hood.

Gas Production Fume Hood: A fume hood approximately, 12 ft wide by 6 ft deep and 9 feet in height has been used to house the fluorine gas extraction system. This fume hood has not become contaminated during operations. This fume hood is located in Room 301 Gas Production and is not expected to contain any residual radioactive materials.

ICP-MS Fume Hood: A fume hood approximately, 12 ft wide by 6 ft deep and 9 feet in height will be used to house the Perkin Elmer ICP-MS system. This fume hood has not become contaminated during operations. This fume hood is located in Room 302 Analytical Laboratory and is not expected to contain any residual radioactive materials.

Perkin Elmer ICP-MS: The Perkin Elmer ICP-MS is an automated trace element gas/liquid sampling system. The system is currently utilized to determine the impurity concentrations at the parts per trillion level of fluorine gas products. This unit is located in Room 302, Analytical Laboratory and has not become contaminated during operations.

Operational History

The facility operated in a research and development (R&D) mode from January 2006 until January 2013. Between January 23, 2006 and November 25, 2008 a total of 57 test runs using DUF_4 and GeO_2 to produce GeF_4were completed. A total of 41.896 kg of DUF_4 was utilized in the GeF_4 production studies. The largest batch size consisted of 2.67 kg of DUF_4.

Given the small quantities of uranium needed for the studies license SUB-1587 was amended in July 2007 to limit the total quantity of depleted uranium in the 1359 facility to 25 kg and to move storage of DUF_4 to the 4137 Warehouse. A modular room was erected in the 4137 Warehouse to house the DU Drum fume hood to support the 25 kg batch restriction to the 1359 facility. The modular room and equipment remain in place and are outside the scope of this decommissioning effort. R&D activities were curtailed between December 2008 and July 2010 to re-configure the gas production and collection system to support studies on the production and collection of BF_3. After configuration a total of 26 test runs were conducted commencing on July 12, 2010 and ending with the last run on December 12, 2012.

A total of 11.368 kg of DUF_4 was utilized in the BF_3 production studies. In total, the R&D activities conducted at the 1359 facility under SUB-1587 utilized 53.264 kg of DUF_4, refer to the table below.

Test Runs with GeO_2

Date	UF_4 (grams)	Date	UF_4 (grams)	Date	UF_4 (grams)
1/23/2006	135	3/12/2007	211	1/31/2008	211
5/15/2006	135	4/23/2007	212	2/4/2008	211
5/17/2006	135	5/2/2007	211	2/6/2008	212
6/21/2006	135	5/4/2007	211	3/11/2008	633
6/30/2006	801.3	5/9/2007	211	3/17/2008	638
7/20/2006	685	5/18/2007	211	3/19/2008	1329
7/26/2006	135	5/29/2007	213	3/27/2008	1330
8/1/2006	135	6/1/2007	213	4/7/2008	1334
8/3/2006	180	6/5/2007	211	4/10/2008	1367
11/17/2006	211.2	6/7/2007	222	4/14/2008	2658
11/22/2006	213	6/12/2007	211	4/16/2008	2660
11/28/2006	212	6/15/2007	211	4/18/2008	2660
11/30/2006	212	6/19/2007	211	6/19/2008	2660
12/5/2006	211	8/8/2007	211	6/26/2008	2263
12/7/2006	213	8/10/2007	211	6/27/2008	2532
12/15/2006	215	8/27/2007	211	6/30/2008	2670
12/19/2006	211	8/29/2007	209	8/29/2008	493.7
Total 2006	4174.5	10/1/2007	211	9/10/2008	1225.9
		10/2/2007	211	10/6/2008	1639.1
		Total 2007	4023	11/21/2008	2260
				11/25/2008	2712
				Total 2008	33698.7

Test Runs with B_2O_3

Date	UF_4 (grams)	Date	UF_4 (grams)	Date	UF_4 (grams)
7/12/2010	346	2/14/2011	386	6/12/2012	375
7/15/2010	380	5/26/2011	1854	6/20/2012	382
7/19/2010	386	9/30/2011	372	6/26/2012	380
9/23/2010	391	10/12/2011	376	7/16/2012	380
10/20/2010	386	10/18/2011	382	7/24/2012	380
11/15/2010	387	Total 2011	3370	9/4/2012	382
11/18/2010	388			9/25/2012	382
12/15/2010	386			10/23/2012	382
Total 2010	3050			11/13/2012	384
				11/17/2012	384
				11/29/2012	381
				12/5/2012	384
				12/12/2012	372
				Total 2012	4948

During this period of operation depleted uranium compounds were only handled in glove boxes or fume hoods. During this time routine radiological surveys were conducted throughout the facility. Contamination was never identified outside of glove boxes or fume hoods used to handle depleted uranium compounds. Uranium contamination was never identified in the gas collection manifold outside of the reaction vessel or in the fluorine gas product and there was never any spill involving depleted uranium compounds.

Individual's that worked at the 1359 facility were monitored for whole body and extremity exposures, dosimeters were exchanged on a quarterly basis. During this period of operations the highest whole body dose recorded was 14 mrem in one quarter. This was the only instance when a whole body dose exceeding the 10 mrem detection limit of the dosimeter was recorded.

Routine bioassay via urinalysis had been conducted as a precautionary measure from January 2006 until December 2008. The results of these bioassays and continuous air monitoring and grab air sampling indicated that the engineering controls implemented prevented the release of uranium contamination in the work place and subsequent uptakes and routine bioassays were curtailed.

2.0 DECOMMISSIONING PLAN

The scope of this decommissioning activity is to release Building 1359 for unrestricted use in order to support an amendment to NRC license SUB-1587 that removes the Building 1359 facility from the license and revises the authorized licensed activities to possession and storage.

Consistent with NUREG-1757 Volume 2; Building 1359 facility is categorized as Decommissioning Group 2 based on the operational history of the facility and results of routine contamination and airborne radioactive surveys performed during operations and extended periods of shut-down.

Decommissioning of the 1359 Building is sub-divided into the following tasks:

1. Planning and Preparation
2. Facility Characterization
3. Decontamination/Dismantling
4. Packaging
5. Radioactive Material Disposition
6. Final Status Survey and Evaluation

2.1 PLANNING AND PREPARATION

The planning and preparation phase of this decommissioning activity consists of developing a task sequence and schedule, identifying and acquiring as necessary the equipment needed to complete the project, ensuring this equipment is available, calibrated as needed, and operable, identifying disposition path for items to be removed from the facility including the identification of storage areas, identifying release requirements for items to be left behind in the facility.

Background survey measurements were conducted on the concrete floor of the Utility Room (Room 102A) and along the concrete slab along the north and south roll-up doors; these areas are considered non-impacted.

Instrumentation utilized during the R&D activities will be utilized during the decommissioning process, these instruments are identified below:

Instrument	Serial Number	Calibration Due Date
Ludlum 3030	210766	07/18/2013
Ludlum 3030	210769	02/16/2013
Ludlum 2929 w/ 43-01 probe	236413/255983	11/07/2013
Ludlum 2929 w/ 43-01 probe	202409/221513	09/04/2013
Ludlum 2360 w/ 43-93 probe	202409/221513	07/08/2013
Note that Eberline Alpha 7A continuous air monitors as well as Ortec Alpha Spectroscopy are available but are not expected to be required given the levels of residual contamination in the fume hood and glove boxes.		

A disposition log will be maintained for equipment and components that are removed from the facility that may have been in contact with uncontained uranium. The disposition log will identify the piece of equipment by name and serial number (as applicable), a brief description of the equipment, and type of disposition, i.e. storage for future use, storage for subsequent disposal as radioactive material, or unrestricted release. Items that have been released for unrestricted use will include a survey indicating it has been surveyed and shown to be free of residual radioactivity.

The Decommissioning Schedule is provided below; tasks may be completed in parallel.

Task	Estimated Duration
Develop Decommissioning Plan	2 week
Review operating history and radiological surveys to identify items and areas with the potential for containing residual radioactive materials	1 week
Identify items to be removed from facility and categorize as having potential or having no potential for containing residual radioactive materials	3 days
Remove items having no potential for containing residual radioactive materials from the facility	3 weeks
Remove items having a potential for containing residual radioactive materials that will be stored for future use or radioactive material disposal from the facility.	1 week
Survey for release and remove items having a potential for containing residual radioactive materials that will be released for unrestricted use from the facility.	1 week
Survey facility in accordance with the Final Status Survey Plan	3 weeks

2.2 FACILITY CHARACTERIZATION

Facility characterization will be performed following the guidance provided in NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual*, (MARSSIM). Characterization typically consists of; historical site assessment followed by scoping and characterizations surveys, and remedial action surveys if necessary. Considering INIS has been the sole occupant to utilize radioactive materials at the 1359, characterization will be conducted through a review of the routine surveys performed at the facility, which include weekly, monthly and quarterly contamination surveys air sampling data. These surveys have been documented and maintained at the facility since the introduction of depleted uranium. It is important to note that during the course of depleted uranium operations the presence of uranium was never observed in any continuous air monitoring samples, in-line ventilation air samples, work coverage grab samples or in the fluorine gas production stream; and that contamination was never identified on building surfaces. The following definitions from the MARSSIM are included for clarity:

Class 1 area: An *area* that is projected to require a *Class 1 final status survey*.

Class 1 survey: A type of *final status survey* that applies to *areas* with the highest potential for contamination, and meet the following criteria: (1) *impacted*; (2) potential for delivering a dose above the *release criterion*; (3) potential for small *areas of elevated activity*; and (4) insufficient evidence to support reclassification as *Class 2* or *Class* 3.

Class 2 area: An *area* that is projected to require a *Class 2 final status survey*.

Class 2 survey: A type of *final status survey* that applies to *areas* that meet the following criteria: (1) *impacted*; (2) low potential for delivering a dose above the *release criterion*; and (3) little or no potential for small *areas of elevated activity*.

Class 3 area: An *area* that is projected to require a *Class 3 final status survey*.

Class 3 survey: A type of *final status survey* that applies to *areas* that meet the following criteria: (1) *impacted*; (2) little or no potential for delivering a dose above the *release criterion*; and (3) little or no potential for small *areas of elevated activity*.

Impacted area: Any *area* that is not *classified* as *non-impacted*. Areas with a possibility of containing *residual radioactivity* in excess of natural background or fallout levels.

Non-impacted area: Areas where there is no reasonable possibility (extremely low probability) of residual contamination.

Based on the operational history of the facility there are no Class 1 areas identified in the Building 1359 facility. Radioactive contamination is expected in the ventilation duct that serviced the fume hood and glove boxes located in Room 304. The portion of ducting affected is the run between Room 304 and the in line HEPA filters. This portion of ducting will be removed from the facility and disposed of as radioactive waste, in whole or in part. In-line air monitoring during operations downstream of the HEPA filters never identified the presence of uranium.

The facility areas have been classified based on the routine survey data and operational history. Area classifications are provided in the table below.

Area Description	Floor	Walls (≤ 8 ft)	Ceilings/Walls (> 8 ft.)
Reception Area Room 101	Class 3	Non-impacted	Non-impacted
Hallway 102	Class 3	Non-impacted	Non-impacted
Utility Room 102A	Non-impacted	Non-impacted	Non-impacted
Restrooms Rooms 102B & 102C	Class 3	Non-impacted	Non-impacted
2nd Floor Conference Room 201	Non-impacted	Non-impacted	Non-impacted
Gas Production Room 301	Class 3	Non-impacted	Non-impacted
Analytical Laboratory Room 302	Class 3	Non-impacted	Non-impacted
Count Room 303	Class 2	Class 3	Non-impacted
DU Handling Room 304	Class 2	Class 3	Non-impacted
Remainder of Process Area	Class 3	Non-impacted	Non-impacted
401 Process floor Mezzanine	Class 3	N/A	Non-impacted
402 Count Room/DU Handling Room Mezzanine	Class 3	Non-impacted	Non-impacted
Building Exterior	Non-impacted	Non-impacted	Non-impacted

	Upstream Filter	Downstream Filter
Room 304 Ventilation(1)	Class 1	Non-impacted
Fluorine Gas Production Manifold(2)	Class 3	Non-impacted

Notes: (1) HEPA Filter, (2) Metal Micron Filter

2.3 DECONTAMINATION/ DISMANTLING

Decontamination and dismantling efforts are expected to be minimal. The following supports the basis for this assumption.

a. Prior to licensed operations, the building surfaces in the areas where radioactive materials were handled and stored have been sealed in an effort to prevent the migration of radioactive contamination into the building materials as a result of a radioactive spill or through process activities.

b. The interior walls in the production areas are constructed of steel siding or drywall with the original painted surface (prior to license operations) exposed.

c. There are no floor drains and minimal ventilation ductwork in the production area.

d. The fluorine extraction process was a dry process; depleted uranium was never handled as a liquid.

e. There was never a spill of material containing depleted uranium compounds; contamination was never identified during routine facility surveys outside of the fume hoods or glove boxes located in Room 304.

f. Handling of uncontained depleted uranium was only performed in HEPA filtered fume hoods or glove boxes.

g. Air sample, including in-line air samples, grab air samples and continuous air monitoring samples never detected the presence of uranium.

h. The short operating history, small quantity of depleted uranium processed, work control procedures and engineering controls prevented the build-up of radioactive contamination within the structure.

i. The gas production system was never contaminated downstream of the in-line gas particulate filter, uranium was never detected in the fluorine gas product.

Minimal radiological controls, i.e. housekeeping, work in progress surveys and PPE (lab coat and gloves) will be implemented during decontamination/disassembly activities.

2.4 PACKAGING

Packaging of material will be conducted as follows:

Any DUF_4 remaining in the facility will be weighed (if weight is not known), packaged in PVC bag and placed in 1 gallon tin can(s) prior to being transferred to the 4137 warehouse. All other depleted uranium compounds (oxides and oxide/fluoride mixes) will be weighed (if weight is unknown) packaged in PVC bag and placed in a 1 gallon tin can and placed into radioactive waste storage at the 4137 warehouse.

Compactable waste, such as lab trash, swipes and PPE, will be consolidated in double PVC bags for subsequent compaction at the 4137 facility.

Potentially contaminated equipment that will be stored for future use will be decontaminated as necessary to ensure that external surfaces are free of residual contamination. The equipment will be sealed, as needed, to prevent internal contamination from migrating out of the equipment.

Potentially contaminated equipment that will be stored for subsequent disposal as radioactive waste will be packaged in a manner to prevent the spread of contamination. In lieu of packaging, equipment with only internally contaminated surfaces may be sealed to prevent internal contamination from migrating out of the equipment.

When possible, the internal void space of contaminated equipment that is destined for subsequent disposal will be utilized as disposal volume for other contaminated or potentially contaminated items. For example, a length of ventilation duct that is destined for disposal may be filled with other potentially contaminated items destined for disposal.

2.5 RADIOACTIVE MATERIAL DISPOSITION

Radioactive active materials, including contaminated equipment will initially be transferred from the 1359 facility to the 4137 warehouse waste where it will be placed into storage until final disposition.

Unreacted DUF_4 will be placed back into the remaining DUF_4 inventory currently stored in the 4137 warehouse. Some, or all, of this inventory will either be transferred to International Isotopes Inc. NRC License SUB-1011 once the facility has been constructed or it will be disposed of at US Ecology's Richland, Washington waste disposal facility.

Reacted depleted uranium compounds will be transferred to the 4137 warehouse and placed into radioactive waste storage to be disposed of at US Ecology's Richland, Washington waste disposal facility during the next waste disposal campaign.

Compactable radioactive waste collected from or generated during the decommissioning of the 1359 facility will be added to the reactor produced compactable waste stream to be compacted and subsequently disposed of at US Ecology's Richland, Washington waste disposal facility during the next waste disposal campaign.

Contaminated or potentially contaminated equipment/components that have no residual value will be packaged as described in section 2.4 above. These items will be identified on Form F-336 *Potentially Contaminated Equipment Disposition Log* and then transferred to the 4137 warehouse for storage and subsequently disposed of at US Ecology's Richland, Washington waste disposal facility during the next waste disposal campaign.

Contaminated or potentially contaminated equipment/components that have residual value will be packaged as described in section 2.4 above. These items will be identified on Form F-336 *Potentially Contaminated Equipment Disposition Log* and then transferred to the 4137 warehouse for storage and subsequent reuse or resale. Potentially contaminated equipment/components may be reused as is, if transferred to an authorized licensee. Potentially contaminated equipment/components would require decontamination prior to release for unrestricted use.

Uncontaminated equipment/components of residual value that will be removed from the facility will be placed into appropriate storage containers/locations until final disposition.

2.6 FINAL STATUS SURVEY AND EVALUATION

Final status surveys will be performed in accordance with the MARSSIM. Final status surveys will consist of direct and removable contamination surveys conducted in the Class 2 and Class 3 areas identified in the building, note that there are no Class 1 areas located in Building 1359. Surveys exterior to the building as well as soil and building media samples, i.e. paint, piping insulation, or concrete are not considered to be necessary given the operating history of the facility and the physical and chemical form of the depleted uranium compounds handled during the brief operating history of the facility.

The Building 1359 facility has been divided into 8 survey units as follows:

	Floor	Walls (≤ 8 ft)	Ceilings/Walls (> 8 ft.)
Survey Unit #1			
Stair way Conference Room 201	Random scan of area, Direct survey followed by swipe at highest scan location in each room	No survey	No Survey
Survey Unit #2			
Reception Area Room 101 Hallway 102 Restrooms 102B & 102C	Scan 5% of area, Direct survey followed by swipe at 5 highest scan locations in each room	No survey	No Survey
Survey Unit #3			
Gas Production Room 301 Analytical Lab Room 302	Scan 5% of area, Direct survey followed by swipe at 5 highest scan locations in each room	No survey	No Survey
Survey Unit #4			
401 Mezzanine 402 Mezzanine	Scan 5% of area, Direct survey followed by swipe at 5 highest scan locations in each area	No survey	No Survey
Survey Unit #5			
SE Quarter of Process Area SW Quarter of Process Area	Scan 5% of high traffic area and random scan remainder Direct survey 5 followed by swipe at highest scan locations in each quadrant	No survey	No Survey
Survey Unit #6			
NE Quarter of Process Area NW Quarter of Process Area	Scan 5% of high traffic area and random scan remainder Direct survey followed by swipe at 5 highest scan locations in each quadrant	No survey	No Survey
Survey Unit #7			
DU Handling Room 304	Scan 25% of area. Direct survey followed by swipe at 10 highest scan locations	Scan 5% of area Direct survey, 2 highest scan locations each wall	Scan 100% of ceiling in 6 inch width along circumference of duct penetration Direct survey highest scan location
Survey Unit #8 (To be surveyed after all other Final Status Surveys have been conducted and evaluated)			
Count Room 303	Scan 25% of area. Direct survey followed by swipe at 5 highest scan locations	Scan 5% of area Direct survey highest scan location each wall	No survey

Surveys will be documented on Forms F-33A Radiological Survey Report and F33-B, Radiological Survey Report Map.

Final Status Survey results will be evaluated against a screening dose model in accordance with Appendix H of NUREG-1757, Vol. 2. An average Derived Concentration Guideline Level ($DCGL_w$) for the survey unit of 235 dpm/100 cm^2 was derived using the US Nuclear Regulatory Commission's DandD Code, Version 2.1.0

resulting in a TEDE = 2.16E+01 mRem (with 95% CI of 1.92E+01 to 2.45E+01 mRem) using the default Building Occupancy parameters.

A reference area background for scan and direct survey measurements was developed by obtaining 20 direct survey measurements utilizing the Ludlum Model 2360 with Model 43-93 probe. A mean background of 10.95 cpm/100cm^2 with a standard deviation of 2.96 cpm/100cm^2 (54.75 dpm/100cm^2 with a standard deviation of 14.28 dpm/100cm^2) was determined for the concrete floor surfaces. The minimum detectable activity for a static 1 minute measurement was calculated as 91.98 dpm/100 cm^2, 39.1% of the $DCGL_W$ and within the recommended 50% MDA:DCGL ratio. The MDA equation is provided below:

$$MDA = \frac{3 + 3.29\sqrt{RbTs\left(1 + \frac{Ts}{Tb}\right)}}{eff_I \times Ts \times \frac{\text{Probe Area (cm}^2)}{100}}$$

Where:
- Rb = Background countrate (10.95 cpm)
- Ts = Sample count time (1 minute)
- Tb = Background count time (1 minute)
- eff_I = Insturment efficeiency (20%)

Assuming a human performance efficiency of 50% and a scan rate of 5 inches/second, a scanning MDA of 881 dpm/100cm^2 would be observed. During the scan it is assumed that the radiological technician would pause for a period of 10 seconds above an area that exhibited elevated count rates. The scanning MDA during the pause period is calculated at 185 dpm/100cm^2. The Scanning MDA equation is provided below:

$$MDAscan = \frac{3.29 \times \left[\sqrt{\frac{Rb \times i}{60}} \Big/ \sqrt{p}\right] \times \frac{60}{i}}{eff_I \times eff_S \times \frac{\text{Probe Area (cm}^2)}{100}}$$

Where:
- Rb = Background countrate (10.95 cpm)
- i = Observation interval during scan (0.44 seconds)
- p = Performance efficeiency (50%)
- eff_I = Insturment efficeiency (20%)
- Eff_S = Surface efficeiency (100%)

Note: The MDA scan equation during the 10 second pause period is the same as above, where i = 10 seconds.

3.0 REFERENCES

[1] NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual*, Washington D.C: Nuclear Regulatory Commission, December 1997

[2] NUREG-1757, *Consolidated Decommissioning Guidance*, Volumes 1 & 2 Washington D.C: Nuclear Regulatory Commission, September 2006

[3] US Nuclear Regulatory Commission DandD Version 2.1.0

[4] ORNL-6913, *Total Effective Dose Equivalent Associated with Fixed Uranium Surface Contamination*, Oak Ridge National Laboratory, Oak Ridge TN, April 1997

Figure 1. International Isotope Inc. FEP First Floor

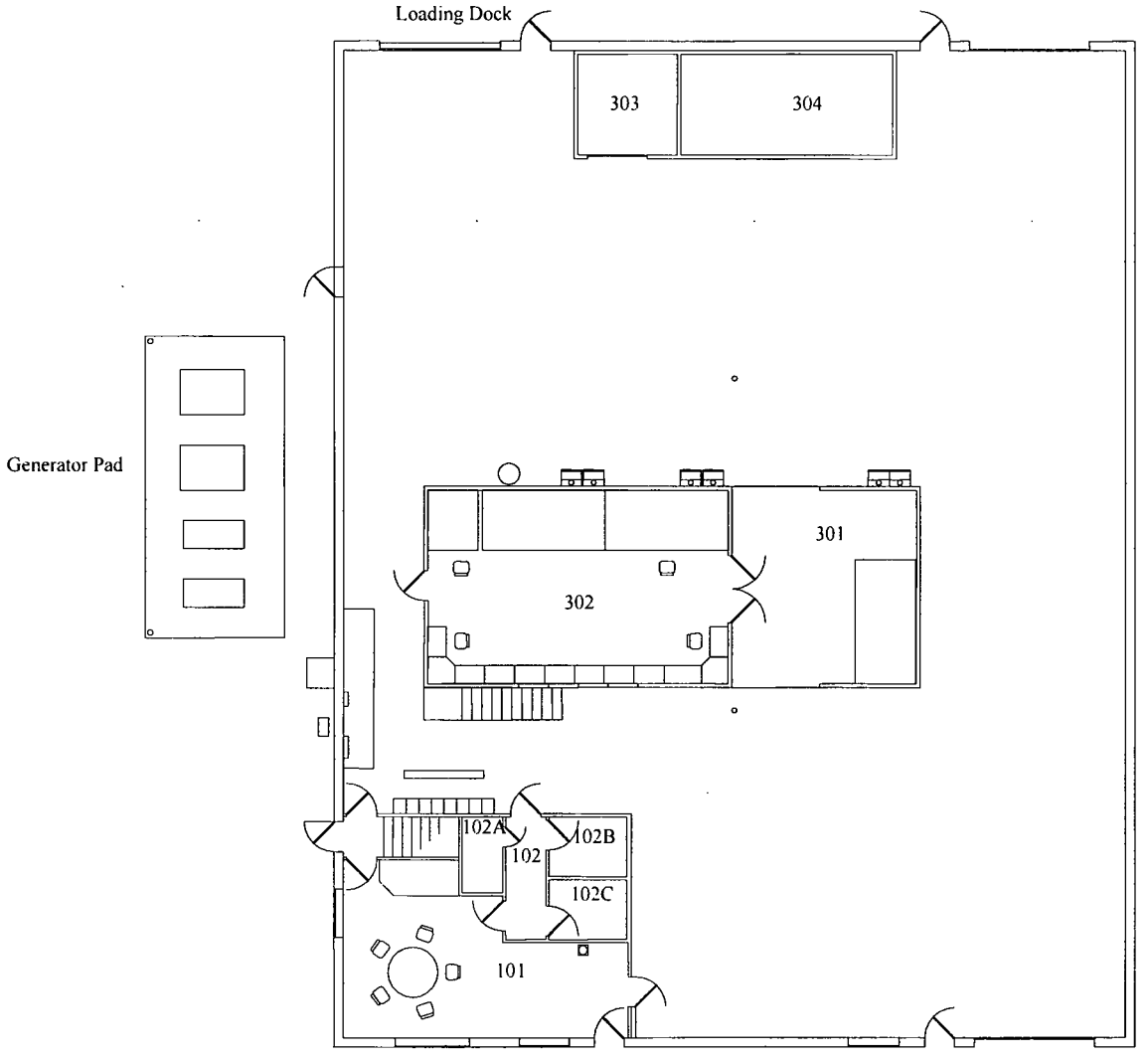
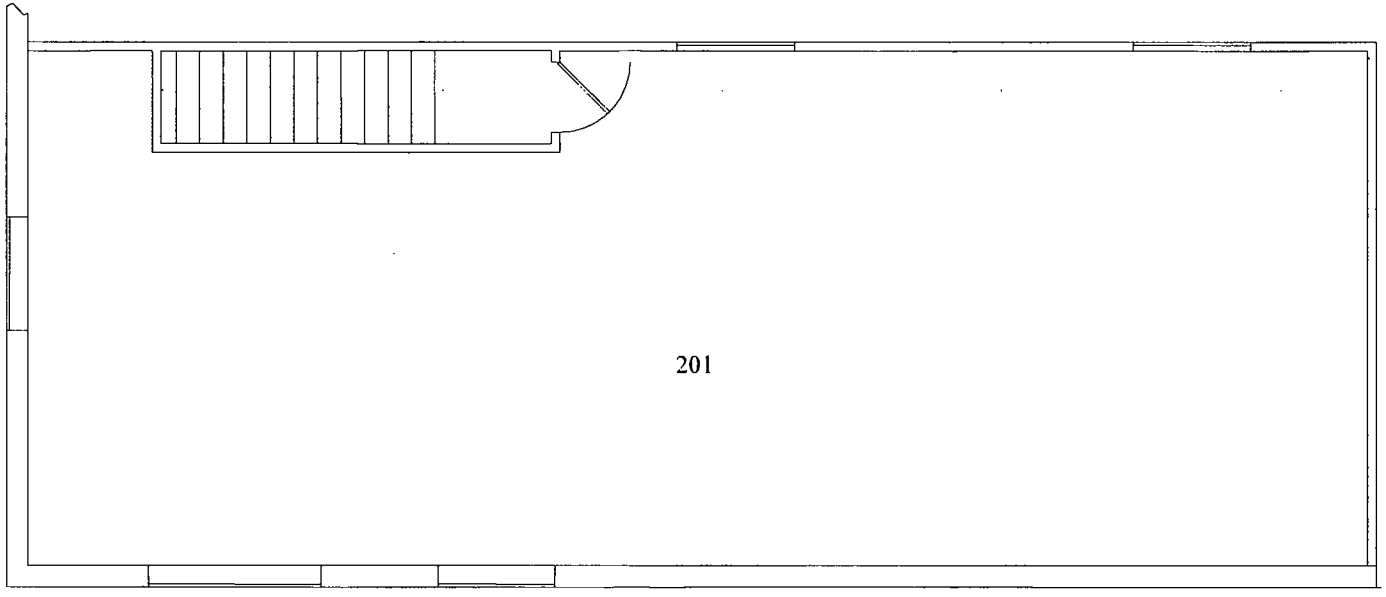


Figure 2. International Isotope Inc. FEP Second Floor



1359 Final Status Survey Report

International Isotopes, Inc.
1359 Commerce Way Facility
NRC License Number SUB-1587

June 25, 2013

Prepared By:	/s/ John Miller	6/25/2013
	John Miller CHP, Radiation Safety Officer, International Isotopes Inc.	Date
Reviewed By:	/s/ Audrey Nelson	6/25/2013
	Audrey Nelson, Quality Assurance Manager International Isotopes Inc.	Date
Approved By:	/s/ Steve Laflin	6/25/2013
	Steve Laflin, President and C.E.O. International Isotopes Inc.	Date

1359 Final Status Survey Report

International Isotopes, Inc.
1359 Commerce Way Facility
NRC License Number SUB-1587

June 25, 2013

This 1359 Final Status Survey Report summarizes the results of the final status surveys conducted in Building 1359 following the removal of all depleted uranium and potentially contaminated equipment and components. Depleted uranium and potentially contaminated equipment will be stored at the 4137 Commerce Circle facility warehouse until it is either disposed of as radioactive waste, released for unrestricted use, or transferred to another license, such as SUB-1011 for future use.

The Building 1359 was subdivided into 8 survey units as described in the 1359 Decommissioning Plan and surveyed in accordance with International Isotopes Inc. procedure OP-RSP-010, Facility Radiological Surveys. The results of these surveys demonstrate Building 1359 is free of residual radioactive material and can be released for unrestricted use and can be removed from US NRC license SUB-1587.

Table of Contents

1.0 FACILITY BACKGROUND

Building History & Description

The 1359 facility is located in the St. Leon Business Park on the north side of Idaho Falls, Idaho. The building is constructed of expanded polymer block filled with approximately four inches of concrete. International Isotopes Inc. (INIS) became the sole leasing tenant (lease) of the facility in February 2004. Prior to the INIS lease the facility was occupied by Alliance Contractors, a vinyl siding and window distributor. There is no reason to believe radioactive materials where introduced into this facility by the prior occupant and this was the sole occupant prior to INIS's lease.

The 1359 facility is equipped with its own septic system that currently serves the restrooms and floor drains located in the restrooms and utility closet. There are no floor drains in the remainder of the building.

The facility is approximately 80 feet wide by 100 feet deep Room numbers and functions are listed in the table below. Refer to the facility diagram enclosed with this plan.

Room	Function
101	Reception Area
102	Utility Hall Way
102A	Utility Closet
102B	Men's Restroom
102C	Women's Restroom
201	Second Floor Conference Room
301	Gas Production Skid
302	Analytical Laboratory
303	Count Room
304	Powder Handling (UF_4, U_3O_8, GeO_2, B_2O_3)
401	Process Floor Mezzanine
402	Count Room/DU Handling Room Mezzanine

Interior walls of the production area are constructed of steel siding. The production area floors are constructed of sealed concrete. There are no floor drains associated with the production area. Approximately 350 linear feet of ventilation ducting exists in the facility, only a small run of ventilation ducting has the potential for radiological contamination since it is upstream of an installed HEPA filter. Approximately 90% of the gas production system is located on a skid, that was contained within an enclosed ventilation controlled cabinet, and which can be removed from the facility utilizing a fork lift.

The following list describes the major pieces of equipment that have been used in the radiological work and fluorine gas production processes equipment.

DUF_4/DUOxide Stainless Steel Glove Box: A stainless steel glove box had been used to transfer batches of UF_4 into the reaction tray. This glove box was used very infrequently because small batch sizes did not require the use of the glove box. The glove box was removed from Building 1359 and is currently stored in the 4137 Warehouse.

DUF_4/DUOxide Plexiglas Glove Box: A small Plexiglas glove box has been utilized to transfer batches of UF_4 into the reaction tray. Low levels of residual depleted uranium are expected to be present in this glove box. The glove box was removed from Building 1359 and is currently stored in the 4137 Warehouse.

DUF_4/DUOxide Fume Hood: A small Plexiglas fume hood has been utilized to perform visual inspections of the reacted depleted uranium and GeO_2 or B_2O_3 following a batch run. Low levels of residual depleted uranium are expected to be present in this fume hood. The glove box was removed from Building 1359 and is currently stored in the 4137 Warehouse.

Gas Production Fume Hood: A fume hood approximately, 12 feet wide by 6 feet deep and 9 feet in height has been used to house the fluorine gas extraction system. This fume hood has not become contaminated during operations. This fume hood was disassembled and moved to the 4137 Warehouse for storage.

ICP-MS Fume Hood: A fume hood approximately, 12 feet wide by 6 feet deep and 9 feet in height was used to house the Perkin Elmer ICP-MS system. This fume hood has not become contaminated during operations. This fume hood was disassembled and moved to the 4137 Warehouse for storage.

Perkin Elmer ICP-MS: The Perkin Elmer ICP-MS is an automated trace element gas/liquid sampling system. The system was utilized to determine the impurity concentrations at the parts per trillion level of fluorine gas products. This unit was located in Room 302, Analytical Laboratory and has not become contaminated during operations. This piece of equipment was moved to the 4137 Warehouse for storage.

A list of other equipment removed from the 1359 facility is provided on the equipment disposition log, along with a copy of the radiological surveys supporting removal are included in this report. Original radiological surveys are maintained on file at the 4137 facility.

Operational History

The facility operated in a research and development (R&D) mode from January 2006 until January 2013. Between January 23, 2006 and November 25, 2008 a total of 57 test runs using DUF_4 and GeO_2 to produce GeF_4were completed. A total of 41.896 kg of DUF_4 was utilized in the GeF_4 production studies. The largest batch size consisted of 2.67 kg of DUF_4.

R&D activities were curtailed between December 2008 and July 2010 to re-configure the gas production and collection system to support studies on the production and collection of BF_3.

After configuration a total of 26 test runs were conducted commencing on July 12, 2010 and ending with the last run on December 12, 2012. A total of 11.368 kg of DUF_4 was utilized in the BF_3 production studies. In total, the R&D activities conducted at the 1359 facility under SUB-1587 utilized 53.264 kg of DUF_4, refer to the table below.

Test Runs with GeO_2

Date	UF_4 (grams)	Date	UF_4 (grams)	Date	UF_4 (grams)
1/23/2006	135	3/12/2007	211	1/31/2008	211
5/15/2006	135	4/23/2007	212	2/4/2008	211
5/17/2006	135	5/2/2007	211	2/6/2008	212
6/21/2006	135	5/4/2007	211	3/11/2008	633
6/30/2006	801.3	5/9/2007	211	3/17/2008	638
7/20/2006	685	5/18/2007	211	3/19/2008	1329
7/26/2006	135	5/29/2007	213	3/27/2008	1330
8/1/2006	135	6/1/2007	213	4/7/2008	1334
8/3/2006	180	6/5/2007	211	4/10/2008	1367
11/17/2006	211.2	6/7/2007	222	4/14/2008	2658
11/22/2006	213	6/12/2007	211	4/16/2008	2660
11/28/2006	212	6/15/2007	211	4/18/2008	2660
11/30/2006	212	6/19/2007	211	6/19/2008	2660
12/5/2006	211	8/8/2007	211	6/26/2008	2263
12/7/2006	213	8/10/2007	211	6/27/2008	2532
12/15/2006	215	8/27/2007	211	6/30/2008	2670
12/19/2006	211	8/29/2007	209	8/29/2008	493.7
Total 2006	4174.5	10/1/2007	211	9/10/2008	1225.9
		10/2/2007	211	10/6/2008	1639.1
		Total 2007	4023	11/21/2008	2260
				11/25/2008	2712
				Total 2008	33698.7

Test Runs with B_2O_3

Date	UF_4 (grams)	Date	UF_4 (grams)	Date	UF_4 (grams)
7/12/2010	346	2/14/2011	386	6/12/2012	375
7/15/2010	380	5/26/2011	1854	6/20/2012	382
7/19/2010	386	9/30/2011	372	6/26/2012	380
9/23/2010	391	10/12/2011	376	7/16/2012	380
10/20/2010	386	10/18/2011	382	7/24/2012	380
11/15/2010	387	Total 2011	3370	9/4/2012	382
11/18/2010	388			9/25/2012	382
12/15/2010	386			10/23/2012	382
Total 2010	3050			11/13/2012	384
				11/17/2012	384
				11/29/2012	381
				12/5/2012	384
				12/12/2012	372
				Total 2012	4948

During operations depleted uranium compounds were only handled in glove boxes or fume hoods. Routine radiological surveys were conducted throughout the facility at weekly, monthly and quarterly frequencies and formed the basis of the area classifications and final status survey requirements.

Contamination was never identified outside of glove boxes or fume hoods used to handle depleted uranium compounds. Uranium contamination was never identified in the gas collection manifold outside of the reaction vessel or in the fluorine gas product and there was never any spill involving depleted uranium compounds.

Individual's that worked at the 1359 facility were monitored for whole body and extremity exposures, dosimeters were exchanged on a quarterly basis. During this period of operations the highest whole body dose recorded was 14 mrem in one quarter. This was the only instance when a whole body dose exceeding the 10 mrem detection limit of the dosimeter was recorded.

Routine bioassay via urinalysis had been conducted as a precautionary measure from January 2006 until December 2008. The results of these bioassays and continuous air monitoring and grab air sampling indicated that the engineering controls implemented prevented the release of uranium contamination in the work place so routine bioassays were curtailed, while continuous air monitoring or the workplace continued. During the period of operations air monitoring samples and routing bioassay measurements failed to detect the presence of uranium.

2.0 DECOMMISSIONING PLAN

The scope of the decommissioning activity was limited to releasing Building 1359 for unrestricted use to remove Building 1359 from NRC license SUB-1587 and to revise the authorized licensed activities to possession and storage.

Consistent with NUREG-1757 Volume 2; Building 1359 facility was categorized as Decommissioning Group 2 based on the operational history of the facility and results of routine contamination and airborne radioactive surveys performed during operations and extended periods of shut-down.

Decommissioning of the 1359 Building was sub-divided into the following tasks:

1. Planning and Preparation
2. Facility Characterization
3. Decontamination/Dismantling
4. Packaging
5. Radioactive Material Disposition
6. Final Status Survey and Evaluation

2.1 PLANNING AND PREPARATION

The planning and preparation phase of this decommissioning activity consisted of developing a task sequence and schedule, identifying and acquiring as necessary the equipment needed to complete the project, ensuring this equipment is available, calibrated as needed, and operable, identifying disposition path for items to be removed from the facility including the identification of storage areas, identifying release requirements for items to be left behind in the facility.

Background survey measurements were conducted on the concrete floor of the Utility Room (Room 102A) and along the concrete slab along the north and south roll-up doors; these areas are considered non-impacted.

Instrumentation utilized during the R&D activities were utilized during the decommissioning process, these instruments are identified below:

Instrument	Serial Number	Calibration Due Date
Ludlum 3030	210766	07/18/2013
Ludlum 3030	210769	02/16/2013
Ludlum 2360 w/ 43-93 probe	202409/221513	07/08/2013

A disposition log was utilized to record equipment and components that were removed from the facility that may have been in contact with uncontained uranium. The disposition log identified the piece of equipment by name and serial number (as applicable), a brief description of the equipment, and type of disposition, i.e. storage for future use, storage for subsequent disposal as radioactive material, or unrestricted release. A copy of the log is included in this report.

2.2 FACILITY CHARACTERIZATION

Facility characterization was performed following the guidance provided in NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual*, (MARSSIM). Characterization typically consists of; historical site assessment followed by scoping and characterizations surveys, and remedial action surveys if necessary. Considering INIS has been the sole occupant to utilize radioactive materials at the 1359, characterization was conducted through a review of the routine surveys performed at the facility, which included weekly, monthly and quarterly contamination surveys and air sampling data. These surveys have been documented and maintained at the facility since the introduction of depleted uranium. It is important to note that during the course of depleted uranium operations the presence of uranium was never observed in any continuous air monitoring samples, in-line ventilation air samples, work coverage grab samples or in the fluorine gas production stream; and that contamination was never identified outside of any controlled area on building surfaces. The following definitions from the MARSSIM are included for clarity:

Class 1 area: An *area* that is projected to require a *Class 1 final status survey*.

Class 1 survey: A type of *final status survey* that applies to *areas* with the highest potential for contamination, and meet the following criteria: (1) *impacted*; (2) potential for delivering a dose above the *release criterion*; (3) potential for small *areas of elevated activity*; and (4) insufficient evidence to support reclassification as *Class 2* or *Class* 3.

Class 2 area: An *area* that is projected to require a *Class 2 final status survey*.

Class 2 survey: A type of *final status survey* that applies to *areas* that meet the following criteria: (1) *impacted*; (2) low potential for delivering a dose above the *release criterion*; and (3) little or no potential for small *areas of elevated activity*.

Class 3 area: An *area* that is projected to require a *Class 3 final status survey*.

Class 3 survey: A type of *final status survey* that applies to *areas* that meet the following criteria: (1) *impacted*; (2) little or no potential for delivering a dose above the *release criterion*; and (3) little or no potential for small *areas of elevated activity*.

Impacted area: Any *area* that is not *classified* as *non-impacted*. Areas with a possibility of containing *residual radioactivity* in excess of natural background or fallout levels.

Non-impacted area: Areas where there is no reasonable possibility (extremely low probability) of residual contamination.

Based on the operational history of the facility there are no Class 1 areas identified in the Building 1359 facility. Radioactive contamination was expected and confirmed in the ventilation duct that serviced the fume hood and glove boxes located in Room 304. The levels of contamination identified in the duct were less than 1,000 dpm over large area wipes. This portion of the duct work was sealed at both ends and transferred to the 4137 warehouse for subsequent disposal as radioactive waste. In-line air monitoring during operations downstream of the HEPA filters never identified the presence of uranium.

This section of duct was confirmed to be free of contamination downstream of the HEPA filters.

The facility areas have been classified based on the routine survey data and operational history. Area classifications are provided in the table below.

Area Description	Floor	Walls (≤ 8 ft)	Ceilings/Walls (> 8 ft.)
Reception Area Room 101	Class 3	Non-impacted	Non-impacted
Hallway 102	Class 3	Non-impacted	Non-impacted
Utility Room 102A	Non-impacted	Non-impacted	Non-impacted
Restrooms Rooms 102B & 102C	Class 3	Non-impacted	Non-impacted
2nd Floor Conference Room 201	Non-impacted	Non-impacted	Non-impacted
Gas Production Room 301	Class 3	Non-impacted	Non-impacted
Analytical Laboratory Room 302	Class 3	Non-impacted	Non-impacted
Count Room 303	Class 2	Class 3	Non-impacted
DU Handling Room 304	Class 2	Class 3	Non-impacted
Remainder of Process Area	Class 3	Non-impacted	Non-impacted
401 Process floor Mezzanine	Class 3	N/A	Non-impacted
402 Count Room/DU Handling Room Mezzanine	Class 3	Non-impacted	Non-impacted
Building Exterior	Non-impacted	Non-impacted	Non-impacted
	Upstream Filter	Downstream Filter	
Room 304 Ventilation(1)	Class 1	Non-impacted	
Fluorine Gas Production Manifold(2)	Class 3	Non-impacted	
Notes: (1) HEPA Filter, (2) Metal Micron Filter			

2.3 DECONTAMINATION/ DISMANTLING

Decontamination and dismantling and removal of ventilation ducting, fume hoods and equipment was conducted prior to final status surveys. A list of equipment removed from the facility, along with a copy of the radiological surveys supporting the removal are provided in Attachments 1 and 2.

2.4 PACKAGING

Packaging of material has been conducted as follows:

The DUF_4 remaining in the facility has been packaged in a PVC bag and was placed in 1 gallon tin can and transferred to the 4137 warehouse. All other depleted uranium compounds (oxides and oxide/fluoride mixes) were packaged in PVC bag and placed in a 1 gallon tin can and placed into radioactive waste storage at the 4137 warehouse.

Compactable waste, such as lab trash, swipes and PPE, were consolidated in double PVC bags for subsequent compaction at the 4137 facility.

The metal glove box, plexiglass glove box and small fume hood were sealed and transferred to the 4137 warehouse for storage. These items will be decontaminated as necessary and reutilized for other licensed operations.

2.5 RADIOACTIVE MATERIAL DISPOSITION

Radioactive active materials, including contaminated equipment have been transferred from the 1359 facility to the 4137 warehouse where it has been placed into storage until final disposition.

Unreacted DUF_4 was returned to DUF_4 inventory and is currently stored in the 4137 warehouse. Some, or all, of this inventory will either be transferred to International Isotopes Inc. NRC License SUB-1011 once the facility has been constructed or it will be disposed of at US Ecology's Richland, Washington waste disposal facility.

Reacted depleted uranium compounds have been transferred to the 4137 warehouse and were placed into radioactive waste storage to be disposed of at US Ecology's Richland, Washington waste disposal facility during the next waste disposal campaign.

Compactable radioactive waste that was located in the 1359 facility or had been generated during the decommissioning of the 1359 facility has been added compactable waste stream and will be compacted and subsequently disposed of at US Ecology's Richland, Washington waste disposal facility during the next waste disposal campaign.

Contaminated or potentially contaminated equipment/components that have no residual value have been packaged as described in section 2.4 above and were transferred to the 4137 warehouse for storage and subsequently disposed of at US Ecology's Richland, Washington waste disposal facility during the next waste disposal campaign.

Contaminated or potentially contaminated equipment/components that have residual value have been packaged as described in section 2.4 above and were transferred to the 4137 warehouse for storage and subsequent reuse or resale. Potentially contaminated equipment/components may be reused as is, if transferred to an authorized licensee. Potentially contaminated equipment/components would require decontamination prior to release for unrestricted use.

Uncontaminated equipment/components of residual value were removed from the facility and placed into appropriate storage containers/locations until final disposition.

2.6 FINAL STATUS SURVEY AND EVALUATION

Final status surveys were performed in accordance with the MARSSIM. Final status surveys consisted of direct and removable contamination surveys conducted in the Class 2 and Class 3 areas identified in the building, note that there are no Class 1 areas located in Building 1359. Surveys exterior to the building as well as soil and building media samples, i.e. paint, piping insulation, or concrete were not considered to be necessary

given the operating history of the facility and the physical and chemical form of the depleted uranium compounds handled during the brief operating history of the facility.

The Building 1359 facility had been divided into 8 survey units as follows:

	Floor		Walls (≤ 8 ft)	Ceilings/Walls (> 8 ft.)
Survey Unit #1				
Stair way Conference Room 201	Random scan of area, Direct survey followed by swipe at highest scan location in each room		No survey	No Survey
	Location	Floor Area		
	Room 201	488 ft^2		
Survey Unit #2				
Reception Area Room 101 Hallway 102 Restrooms 102B & 102C	Scan 5% of area, Direct survey followed by swipe at 5 highest scan locations in each room		No survey	No Survey
	Location	Floor Area		
	Room 101	273 ft^2		
	Hallway 102	64 ft^2		
	Restroom 102B	46 ft^2		
	Restroom 102C	46 ft^2		
Survey Unit #3				
Gas Production Room 301 Analytical Lab Room 302	Scan 5% of area, Direct survey followed by swipe at 5 highest scan locations in each room		No survey	No Survey
	Location	Area (Ft^2)		
	Room 301	350 ft^2		
	Room 302	521 ft^2		
Survey Unit #4				
401 Mezzanine 402 Mezzanine	Scan 5% of area, Direct survey followed by swipe at 5 highest scan locations in each area		No survey	No Survey
	Location	Area (Ft^2)		
	401 Mezzanine	1010 ft^2		
	402 Mezzanine	391 ft^2		
Survey Unit #5				
SE Quarter of Process Area SW Quarter of Process Area	Scan 5% of high traffic area and random scan remainder Direct survey 5 followed by swipe at highest scan locations in each quadrant		No survey	No Survey
	Location	Area (Ft^2)		
	SE Qtr of PA	1720 ft^2		
	SW Qtr of PA	754 ft^2		

	Floor		Walls (≤ 8 ft)	Ceilings/Walls (> 8 ft.)
Survey Unit #6				
NE Quarter of Process Area NW Quarter of Process Area	Scan 5% of high traffic area and random scan remainder Direct survey followed by swipe at 5 highest scan locations in each quadrant		No survey	No Survey
	Location	Area (Ft^2)		
	NE Qtr of PA	2114 ft^2		
	NW Qtr of PA	2114 ft^2		
Survey Unit #7				
DU Handling Room 304	Scan 25% of area. Direct survey followed by swipe at 10 highest scan locations		Scan 5% of area Direct survey, 2 highest scan locations each wall	Scan 100% of ceiling in 6 inch width along circumference of duct penetration Direct survey highest scan location
	Location	Area (Ft^2)		
	Room 304	230 ft^2		
Survey Unit #8 (To be surveyed after all other Final Status Surveys have been conducted and evaluated)				
Count Room 303	Scan 25% of area. Direct survey followed by swipe at 5 highest scan locations		Scan 5% of area Direct survey highest scan location each wall	No survey
	Location	Area (Ft^2)		
	Room 303	105 ft^2		

Final status surveys were documented on Forms F-33A Radiological Survey Report and F33-B, Radiological Survey Report Map.

An average Derived Concentration Guideline Level ($DCGL_w$) for the survey unit of 235 dpm/100 cm^2 was derived using the US Nuclear Regulatory Commission's D and D Code, Version 2.1.0 resulting in a TEDE = 2.16E+01 mRem (with 95% CI of 1.92E+01 to 2.45E+01 mRem) using the default Building Occupancy parameters.

A reference area background for scan and direct survey measurements was developed by obtaining 20 direct survey measurements utilizing the Ludlum Model 2360 with Model 43-93 probe. The reference area background was used to determine the minimum detectable activity for a 1 minute static measurement but was not subtracted from the direct survey measurements performed on the concrete building surfaces.

A mean background of 10.95 cpm/100cm^2 with a standard deviation of 2.96 cpm/100cm^2 (54.75 dpm/100cm^2 with a standard deviation of 14.28 dpm/100cm^2) was determined for the concrete floor surfaces. The minimum detectable activity for a static 1 minute measurement was calculated as 91.98 dpm/100 cm^2, 39.1% of the $DCGL_w$ and within the recommended 50% MDA:DCGL ratio.

The MDA equation is provided below:

$$MDA = \frac{3 + 3.29\sqrt{RbTs\left(1 + \frac{Ts}{Tb}\right)}}{eff_I \times Ts \times \frac{\text{Probe Area (cm}^2)}{100}}$$

Where:
- Rb = Background countrate (10.95 cpm)
- Ts = Sample count time (1 minute)
- Tb = Background count time (1 minute)
- effi = Insturment efficeiency (20%)

Assuming a human performance efficiency of 50% and a scan rate of 5 inches/second, a scanning MDA of 881 dpm/100cm^2 would be observed. During the scan it is assumed that the radiological technician would pause for a period of 10 seconds above an area that exhibited elevated count rates. The scanning MDA during the pause period is calculated at 185 dpm/100cm^2. The Scanning MDA equation is provided below:

$$MDAscan = \frac{3.29 \times \left[\sqrt{\frac{Rb \times i}{60}} \Big/ \sqrt{p}\right] \times \frac{60}{i}}{eff_I \times eff_S \times \frac{\text{Probe Area (cm}^2)}{100}}$$

Where:
- Rb = Background countrate (10.95 cpm)
- i = Observation interval during scan (0.44 seconds)
- p = Performance efficeiency (50%)
- effi = Insturment efficeiency (20%)
- Effs = Surface efficeiency (100%)

Note: The MDA scan equation during the 10 second pause period is the same as above, where i = 10 seconds.

Original final status surveys are maintained on file at the International Isotopes Inc. 4137 facility. While background measurements for direct surveys of the facility were obtained prior to conducting the final status surveys, the data presented below does not subtract the background for direct measurements nor is the instrument background subtracted from the swipe survey measurements providing conservative results.

In all survey units the maximum and average survey results are below the average Derived Concentration Guideline Level ($DCGL_W$) of 235 dpm/100 cm^2.

Summaries of the final status surveys conducted in Survey Units 1 through 8 are provided below.

Survey Unit #1: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1.0	10	1	1	17.7	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1.0	10	1	1	17.7	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	3	Random Scan on of stairs	20	20	100	/100cm^2
2	3	Direct Survey on highest scan on stairs	8	8	40	/100cm^2
3	1	Swipe on highest scan on stairs	12	12	12	/swipe
4	3	Random Scan on floor room 201	20	20	100	/100cm^2
5	3	Direct Survey highest scan 201 floor	15	15	15	/100cm^2
6	2	Swipe on highest scan 201 floor	5	5	11	/swipe
				Maximum:	100	dpm/100cm^2
				Average:	55	dpm/100cm^2

Survey Unit #2: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	10	1	1	17.7	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	10	1	1	17.7	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	3	Scan on 5% of floor room 101	22	22	110	/100cm^2
2	3	Direct Survey (1/5) highest scan room 101	5	5	25	/100cm^2
3	3	Direct Survey (2/5) highest scan room 101	8	8	40	/100cm^2
4	3	Direct Survey (3/5) highest scan room 101	6	6	30	/100cm^2
5	3	Direct Survey (4/5) highest scan room 101	12	12	60	/100cm^2
6	3	Direct Survey (5/5) highest scan room 101	11	11	55	/100cm^2
7	1	Swipe floor (1/5) highest scan room 101	15	15	15	/swipe
8	2	Swipe floor (2/5) highest scan room 101	8	8	8	/swipe
9	1	Swipe floor (3/5) highest scan room 101	7	7	7	/swipe
10	2	Swipe floor (4/5) highest scan room 101	2	2	2	/swipe
11	1	Swipe floor (5/5) highest scan room 101	12	12	12	/swipe

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
12	3	Scan on 5% of floor hallway 102	10	10	50	/100cm^2
13	3	Direct Survey (1/5) highest scan hallway 102	16	16	80	/100cm^2
14	3	Direct Survey (2/5) highest scan hallway 102	13	13	65	/100cm^2
15	3	Direct Survey (3/5) highest scan hallway 102	9	9	45	/100cm^2
16	3	Direct Survey (4/5) highest scan hallway 102	8	8	40	/100cm^2
17	3	Direct Survey (5/5) highest scan hallway 102	9	9	45	/100cm^2
18	2	Swipe floor (1/5) highest scan hallway 102	0	0	0	/swipe
19	1	Swipe floor (2/5) highest scan hallway 102	12	12	12	/swipe
20	2	Swipe floor (3/5) highest scan hallway 102	8	8	8	/swipe
21	1	Swipe floor (4/5) highest scan hallway 102	20	20	20	/swipe
22	2	Swipe floor (5/5) highest scan hallway 102	8	8	8	/swipe
23	3	Scan on 5% of floor room 102B	18	18	90	/100cm^2
24	3	Direct Survey (1/5) highest scan room 102B	9	9	45	/100cm^2
25	3	Direct Survey (2/5) highest scan room 102B	7	7	35	/100cm^2
26	3	Direct Survey (3/5) highest scan room 102B	6	6	30	/100cm^2
27	3	Direct Survey (4/5) highest scan room 102B	8	8	40	/100cm^2
28	3	Direct Survey (5/5) highest scan room 102B	7	7	35	/100cm^2
29	1	Swipe floor (1/5) highest scan room 102B	20	20	20	/swipe
30	2	Swipe floor (2/5) highest scan room 102B	5	5	5	/swipe
31	1	Swipe floor (3/5) highest scan room 102B	15	15	15	/swipe
32	2	Swipe floor (4/5) highest scan room 102B	2	2	2	/swipe
33	1	Swipe floor (5/5) highest scan room 102B	10	10	10	/swipe
34	3	Scan on 5% of floor room 102C	8	8	40	/100cm^2
35	3	Direct Survey (1/5) highest scan room 102C	2	2	10	/100cm^2
36	3	Direct Survey (2/5) highest scan room 102C	9	9	45	/100cm^2
37	3	Direct Survey (3/5) highest scan room 102C	6	6	30	/100cm^2
38	3	Direct Survey (4/5) highest scan room 102C	7	7	35	/100cm^2
39	3	Direct Survey (5/5) highest scan room 102C	7	7	35	/100cm^2
40	2	Swipe floor (1/5) highest scan room 102C	8	8	8	/swipe
41	1	Swipe floor (2/5) highest scan room 102C	15	15	15	/swipe
42	2	Swipe floor (3/5) highest scan room 102C	2	2	2	/swipe
43	1	Swipe floor (4/5) highest scan room 102C	20	20	20	/swipe
44	2	Swipe floor (5/5) highest scan room 102C	13	13	13	/swipe
				Maximum:	110	dpm/100cm^2
				Average:	30	dpm/100cm^2

Survey Unit #3: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	7	1	1	15.3	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	5	1	1	13.4	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	4	Scan on 5% of floor room 301	20	20	100	/100cm^2
2	4	Direct Survey (1/5) highest scan room 301	23	23	115	/100cm^2
3	4	Direct Survey (2/5) highest scan room 301	22	22	110	/100cm^2
4	4	Direct Survey (3/5) highest scan room 301	17	17	85	/100cm^2
5	4	Direct Survey (4/5) highest scan room 301	11	11	55	/100cm^2
6	4	Direct Survey (5/5) highest scan room 301	12	12	60	/100cm^2
7	1	Swipe floor (1/5) highest scan room 301	17	17	17	/swipe
8	2	Swipe floor (2/5) highest scan room 301	5	5	5	/swipe
9	1	Swipe floor (3/5) highest scan room 301	7	7	7	/swipe
10	2	Swipe floor (4/5) highest scan room 301	5	5	5	/swipe
11	1	Swipe floor (5/5) highest scan room 301	5	5	5	/swipe
12	4	Scan on 5% of floor room 302	20	20	100	/100cm^2
13	4	Direct Survey (1/5) highest scan room 302	12	12	60	/100cm^2
14	4	Direct Survey (2/5) highest scan room 302	8	8	40	/100cm^2
15	4	Direct Survey (3/5) highest scan room 302	13	13	65	/100cm^2
16	4	Direct Survey (4/5) highest scan room 302	14	14	70	/100cm^2
17	4	Direct Survey (5/5) highest scan room 302	12	12	60	/100cm^2
18	2	Swipe floor (1/5) highest scan room 302	0	0	0	/swipe
19	1	Swipe floor (2/5) highest scan room 302	7	7	7	/swipe
20	2	Swipe floor (2/5) highest scan room 302	5	5	5	/swipe
21	1	Swipe floor (4/5) highest scan room 302	5	5	5	/swipe
22	2	Swipe floor (5/5) highest scan room 302	2	2	2	/swipe
				Maximum:	115	dpm/100cm^2
				Average:	44	dpm/100cm^2

Survey Unit #4: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	7	1	1	15.3	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	5	1	1	13.4	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	4	Scan on 5% of floor mezzanine 401	25	25	125	/100cm^2
2	4	Direct Survey (1/5) highest scan mezzanine 401	13	13	65	/100cm^2
3	4	Direct Survey (2/5) highest scan mezzanine 401	15	15	75	/100cm^2
4	4	Direct Survey (3/5) highest scan mezzanine 401	11	11	55	/100cm^2
5	4	Direct Survey (4/5) highest scan mezzanine 401	25	25	125	/100cm^2
6	4	Direct Survey (5/5) highest scan mezzanine 401	16	16	80	/100cm^2
7	1	Swipe floor (1/5) highest scan mezzanine 401	12	12	12	/swipe

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
8	2	Swipe floor (2/5) highest scan mezzanine 401	8	8	8	/swipe
9	1	Swipe floor (3/5) highest scan mezzanine 401	15	15	15	/swipe
10	2	Swipe floor (4/5) highest scan mezzanine 401	5	5	5	/swipe
11	1	Swipe floor (5/5) highest scan mezzanine 401	12	12	12	/swipe
12	4	Scan on 5% of floor mezzanine 402	30	30	150	/100cm^2
13	4	Direct Survey (1/5) highest scan mezzanine 402	17	17	85	/100cm^2
14	4	Direct Survey (2/5) highest scan mezzanine 402	21	21	105	/100cm^2
15	4	Direct Survey (3/5) highest scan mezzanine 402	26	26	130	/100cm^2
16	4	Direct Survey (4/5) highest scan mezzanine 402	21	21	105	/100cm^2
17	4	Direct Survey (5/5) highest scan mezzanine 402	20	20	100	/100cm^2
18	1	Swipe floor (1/5) highest scan mezzanine 402	17	17	17	/swipe
19	2	Swipe floor (2/5) highest scan mezzanine 402	5	5	5	/swipe
20	1	Swipe floor (3/5) highest scan mezzanine 402	10	10	10	/swipe
21	2	Swipe floor (4/5) highest scan mezzanine 402	5	5	5	/swipe
22	1	Swipe floor (5/5) highest scan mezzanine 402	10	10	10	/swipe
				Maximum:	150	dpm/100cm^2
				Average:	59	dpm/100cm^2

Survey Unit #5: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	7	1	1	15.3	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	5	1	1	13.4	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	4	Scan 5% of high traffic SE Process floor	25	25	125	/100cm^2
2	4	Random Scan remainder SE Process floor	20	20	100	/100cm^2
3	4	Direct Survey (1/5) highest scan SE floor	14	14	70	/100cm^2
4	4	Direct Survey (2/5) highest scan SE floor	5	5	25	/100cm^2
5	4	Direct Survey (3/5) highest scan SE floor	15	15	75	/100cm^2
6	4	Direct Survey (4/5) highest scan SE floor	13	13	65	/100cm^2
7	4	Direct Survey (5/5) highest scan SE floor	12	12	60	/100cm^2
8	1	Swipe floor (1/5) highest scan SE floor	10	10	22	/swipe
9	2	Swipe floor (2/5) highest scan SE floor	5	5	11	/swipe
10	1	Swipe floor (3/5) highest scan SE floor	7	7	16	/swipe
11	2	Swipe floor (4/5) highest scan SE floor	5	5	11	/swipe
12	1	Swipe floor (5/5) highest scan SE floor	17	17	38	/swipe
13	4	Scan 5% of high traffic SW Process floor	25	25	125	/100cm^2
14	4	Random Scan remainder SW Process floor	25	25	125	/100cm^2

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
15	4	Direct Survey (1/5) highest scan SW floor	22	22	110	/100cm^2
16	4	Direct Survey (2/5) highest scan SW floor	17	17	85	/100cm^2
17	4	Direct Survey (3/5) highest scan SW floor	22	22	110	/100cm^2
18	4	Direct Survey (4/5) highest scan SW floor	17	17	85	/100cm^2
19	4	Direct Survey (5/5) highest scan SW floor	17	17	85	/100cm^2
20	2	Swipe floor (1/5) highest scan SW floor	2	2	4	/swipe
21	1	Swipe floor (2/5) highest scan SW floor	12	12	27	/swipe
22	2	Swipe floor (3/5) highest scan SW floor	8	8	18	/swipe
23	1	Swipe floor (4/5) highest scan SW floor	17	17	38	/swipe
24	2	Swipe floor (5/5) highest scan SW floor	5	5	11	/swipe
				Maximum:	125	dpm/100cm^2
				Average:	60	dpm/100cm^2

Survey Unit #6: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	7	1	1	15.3	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	5	1	1	13.4	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	3	Scan 5% of high traffic NE Process floor	30	30	150	/100cm^2
2	3	Random Scan remainder NE Process floor	20	20	100	/100cm^2
3	3	Direct Survey (1/5) highest scan NE floor	7	7	35	/100cm^2
4	3	Direct Survey (2/5) highest scan NE floor	17	17	85	/100cm^2
5	3	Direct Survey (3/5) highest scan NE floor	15	15	75	/100cm^2
6	3	Direct Survey (4/5) highest scan NE floor	6	6	30	/100cm^2
7	3	Direct Survey (5/5) highest scan NE floor	36	36	180	/100cm^2
8	1	Swipe floor (1/5) highest scan NE floor	11	11	11	/swipe
9	2	Swipe floor (2/5) highest scan NE floor	0	0	0	/swipe
10	1	Swipe floor (3/5) highest scan NE floor	15	15	15	/swipe
11	2	Swipe floor (4/5) highest scan NE floor	10	10	10	/swipe
12	1	Swipe floor (5/5) highest scan NE floor	10	10	10	/swipe
13	3	Scan 5% of high traffic NW Process floor	25	25	125	/100cm^2
14	3	Random Scan remainder NW Process floor	25	25	125	/100cm^2
15	3	Direct Survey (1/5) highest scan NW floor	8	8	40	/100cm^2
16	3	Direct Survey (2/5) highest scan NW floor	11	11	55	/100cm^2
17	3	Direct Survey (3/5) highest scan NW floor	9	9	45	/100cm^2
18	3	Direct Survey (4/5) highest scan NW floor	8	8	40	/100cm^2
19	3	Direct Survey (5/5) highest scan NW floor	24	24	120	/100cm^2

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
20	2	Swipe floor (1/5) highest scan NW floor	5	5	5	/swipe
21	1	Swipe floor (2/5) highest scan NW floor	10	10	10	/swipe
22	2	Swipe floor (3/5) highest scan NW floor	2	2	2	/swipe
23	1	Swipe floor (4/5) highest scan NW floor	12	12	12	/swipe
24	2	Swipe floor (5/5) highest scan NW floor	8	8	8	/swipe
				Maximum:	180	dpm/100cm^2
				Average:	54	dpm/100cm^2

Survey Unit #7: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	10	1	1	17.7	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	10	1	1	17.7	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	4	304 floor scan 25% of sector 1	20	20	100	/100cm^2
2	4	304 floor scan 25% of sector 2	20	20	100	/100cm^2
3	4	304 floor scan 25% of sector 3	10	10	50	/100cm^2
4	4	304 floor scan 25% of sector 4	10	10	50	/100cm^2
5	4	304 floor scan 25% of sector 5	10	10	50	/100cm^2
6	4	304 floor scan 25% of sector 6	30	30	150	/100cm^2
7	4	304 floor scan 25% of sector 7	10	10	50	/100cm^2
8	4	304 floor scan 25% of sector 8	10	10	50	/100cm^2
9	4	304 floor scan 25% of sector 9	10	10	50	/100cm^2
10	4	304 floor scan 25% of sector 10	10	10	50	/100cm^2
11	4	304 floor scan 25% of sector 11	10	10	50	/100cm^2
12	4	304 floor scan 25% of sector 12	10	10	50	/100cm^2
13	4	304 floor scan 25% of sector 13	10	10	50	/100cm^2
14	4	304 floor scan 25% of sector 14	20	20	100	/100cm^2
15	4	304 floor scan 25% of sector 15	10	10	50	/100cm^2
16	4	Direct Survey highest floor scan sector 6	28	28	140	/100cm^2
17	4	Direct Survey highest floor scan sector 1	19	19	95	/100cm^2
18	4	Direct Survey highest floor scan sector 2	15	15	75	/100cm^2
19	4	Direct Survey highest floor scan sector 14	15	15	75	/100cm^2
20	4	Direct Survey highest floor scan sector 5	19	19	95	/100cm^2
21	4	Direct Survey highest floor scan sector 12	15	15	75	/100cm^2
22	4	Direct Survey highest floor scan sector 11	21	21	105	/100cm^2
23	4	Direct Survey highest floor scan sector 8	7	7	35	/100cm^2
24	4	Direct Survey highest floor scan sector 4	19	19	95	/100cm^2
25	4	Direct Survey highest floor scan sector 10	6	6	30	/100cm^2

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
26	1	Swipe floor highest scan sector 6	10	10	10	/swipe
27	2	Swipe floor highest scan sector 1	7	7	7	/swipe
28	1	Swipe floor highest scan sector 2	0	0	0	/swipe
29	2	Swipe floor highest scan sector 14	7	7	7	/swipe
30	1	Swipe floor highest scan sector 5	10	10	10	/swipe
31	2	Swipe floor highest scan sector 12	12	12	12	/swipe
32	1	Swipe floor highest scan sector 11	2	2	2	/swipe
33	2	Swipe floor highest scan sector 8	7	7	7	/swipe
34	1	Swipe floor highest scan sector 4	2	2	2	/swipe
35	2	Swipe floor highest scan sector 10	0	0	0	/swipe
36	4	Scan on 5% of N. wall up to 8 ft.	20	20	100	/100cm^2
37	4	Scan on 5% of E. wall up to 8 ft.	10	10	50	/100cm^2
38	4	Scan on 5% of S. wall up to 8 ft.	20	20	100	/100cm^2
39	4	Scan on 5% of W. wall up to 8 ft.	20	20	100	/100cm^2
40	4	Direct Survey (1/2) highest scan N. wall	5	5	25	/100cm^2
41	4	Direct Survey (2/2) highest scan N. wall	17	17	85	/100cm^2
42	4	Direct Survey (1/2) highest scan E. wall	12	12	60	/100cm^2
43	4	Direct Survey (2/2) highest scan E. wall	12	12	60	/100cm^2
44	4	Direct Survey (1/2) highest scan S. wall	11	11	55	/100cm^2
45	4	Direct Survey (2/2) highest scan S. wall	11	11	55	/100cm^2
46	4	Direct Survey (1/2) highest scan W. wall	18	18	90	/100cm^2
47	4	Direct Survey (2/2) highest scan W. wall	13	13	65	/100cm^2
48	4	Scan ceiling 6 inch width around duct opening	10	10	50	/100cm^2
49	4	Direct Survey highest scan of duct opening	5	5	25	/100cm^2
50	1	Swipe highest scan around duct opening	2	2	2	/swipe
				Maximum:	150	dpm/100cm^2
				Average:	56	dpm/100cm^2

Survey Unit #8: Final Status Survey Summary

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Rb	Ts	Tb	MDA (dpm)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	7	1	1	15.3	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	5	1	1	13.4	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	92.0	/100cm^2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	92.0	/100cm^2

Notes: Ludlum 3030 efficiency = 100%, instrument reports results in dpm.

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
1	4	303 floor scan 25% of sector 1	10	10	50	/100cm^2
2	4	303 floor scan 25% of sector 2	10	10	50	/100cm^2
3	4	303 floor scan 25% of sector 3	10	10	50	/100cm^2
4	4	303 floor scan 25% of sector 4	20	20	100	/100cm^2
5	4	303 floor scan 25% of sector 5	20	20	100	/100cm^2
6	4	303 floor scan 25% of sector 6	10	10	50	/100cm^2

Survey No.	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (dpm)	Units
7	4	Direct Survey highest floor scan sector 4	12	12	60	/100cm^2
8	4	Direct Survey highest floor scan sector 5	17	17	85	/100cm^2
9	4	Direct Survey highest floor scan sector 1	14	14	70	/100cm^2
10	4	Direct Survey highest floor scan sector 2	16	16	80	/100cm^2
11	4	Direct Survey highest floor scan sector 3	15	15	75	/100cm^2
12	1	Swipe floor highest scan sector 4	5	5	5	/swipe
13	2	Swipe floor highest scan sector 5	2	2	2	/swipe
14	1	Swipe floor highest scan sector 1	12	12	12	/swipe
15	2	Swipe floor highest scan sector 2	8	8	8	/swipe
16	1	Swipe floor highest scan sector 3	5	5	5	/swipe
17	4	Scan on 5% of N. wall up to 8 ft.	10	10	50	/100cm^2
18	4	Scan on 5% of E. wall up to 8 ft.	20	20	100	/100cm^2
19	4	Scan on 5% of S. wall up to 8 ft.	10	10	50	/100cm^2
20	4	Scan on 5% of W. wall up to 8 ft.	10	10	50	/100cm^2
21	4	Direct Survey highest scan N. wall	10	10	50	/100cm^2
22	4	Direct Survey highest scan E. wall	22	22	110	/100cm^2
23	4	Direct Survey highest scan S. wall	10	10	50	/100cm^2
24	4	Direct Survey highest scan W. wall	11	11	55	/100cm^2
				Maximum:	110	dpm/100cm^2
				Average:	55	dpm/100cm^2

3.0 REFERENCES

[1] NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual*, Washington D.C: Nuclear Regulatory Commission, December 1997

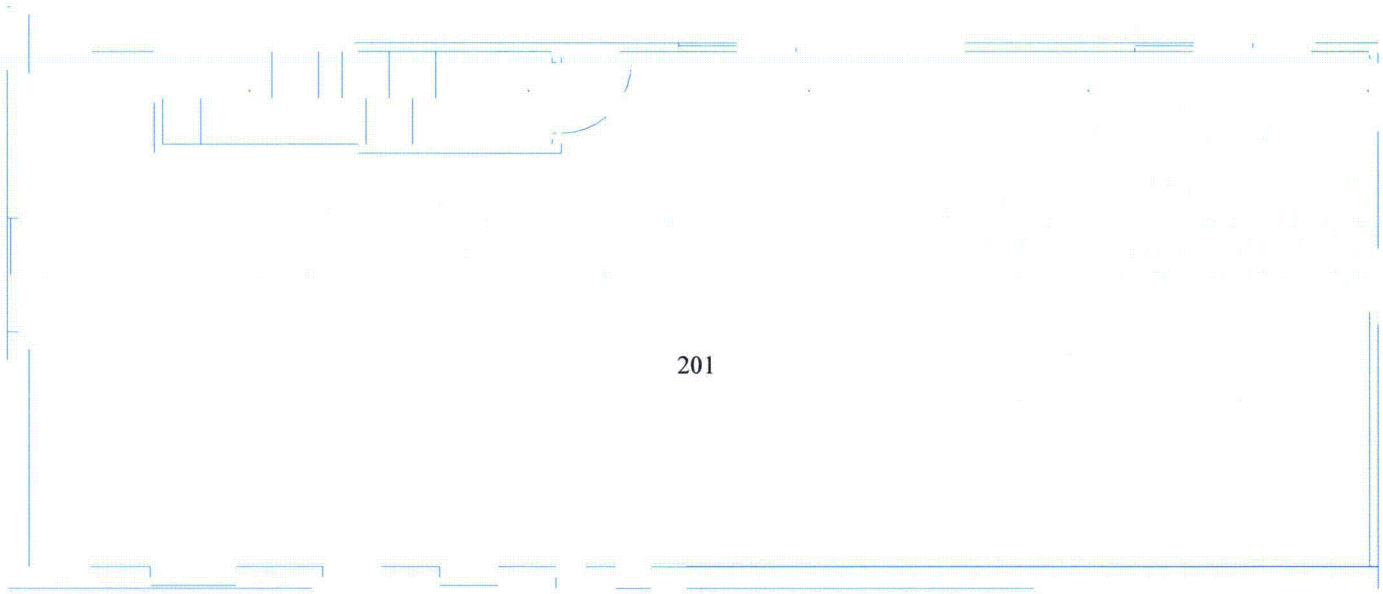
[2] NUREG-1757, *Consolidated Decommissioning Guidance*, Volumes 1 & 2 Washington D.C: Nuclear Regulatory Commission, September 2006

[3] US Nuclear Regulatory Commission DandD Version 2.1.0

[4] ORNL-6913, *Total Effective Dose Equivalent Associated with Fixed Uranium Surface Contamination*, Oak Ridge National Laboratory, Oak Ridge TN, April 1997

Figure 1. International Isotope Inc. FEP First Floor

Figure 2. International Isotope Inc. FEP Second Floor



International Isotopes Inc.

Potentially Contaminated Equipment Disposition Log

Page 1 of 3

No.	Item Name or Description / Serial Number	Location Transferred to	Code(1)	Survey Attached	
1	Fume Hood - EASTEC Monair / BFC10-04SLC / USA	4137 Warehouse	A	Y	
2	Plexiglas glove box / FEP 0196	4137 Warehouse	A	Y	
3	Air pump / sn 3109 / FEP 0199	4137 Warehouse	A	Y	
4	Thermal Anemometer / FEP 0205	4137 Warehouse	C	Y	
5	Alpha 7 continuous air monitor / sn 222	4137 Warehouse	A	Y	
6	Chemical Reactor	4137 Warehouse	B	Y	
7	Post Chemical Reactor filter vessel	4137 Warehouse	B	Y	
8	Chair / FEP 0200	4137 Warehouse	C	Y	
9	Foot Heat Sealer / #443 Singer Sealer	4137 Warehouse	C	Y	
10	HEPA vacuum / sn 197913	4137 Warehouse	A	Y	
11	Stool / FEP 0194	4137 Warehouse	C	Y	
12	Old Flange and parts	4137 Warehouse	A	Y	
13	Lab coats / 5 cloth coats	4137 Warehouse	C	Y	
14	Wall Mounted Lock Box / FEP 0203	4137 Warehouse	C	Y	
15	Lindberg Blue M Tube Furnace / sn R04P-504606-RP / FEP 0220	4137 Warehouse	A	Y	
16	Tube Furnace Tube	4137 Warehouse	B	Y	
17	Chemical Reactor Air Pressure Gauge and Tubing	4137 Warehouse	C	Y	
18	Wall Mounted duct support braces	4137 Warehouse	C	Y	
19	Lg Storage locker room 303 / FEP 0221	4137 Warehouse	C	Y	
20	Movable cabinet with drawers & countertop / FEP 0188	4137 Warehouse	C	Y	
21	55 gallon cold waste barrel	4137 Warehouse	C	Y	
22	20 gallon waste can	4137 Warehouse	C	Y	
23	Wall mounted shelf	4137 Warehouse	C	Y	

Note (1): Code: (A) Storage for Future Use. (B) Storage for subsequent disposal as Radioactive Material. (C) Unrestricted Release

USE ADDITIONAL SHEETS AS NECESSARY

International Isotopes Inc.

Potentially Contaminated Equipment Disposition Log

Page 2 of 3

No.	Item Name or Description / Serial Number	Location Transferred to	Code(1)	Survey Attached	
24	Hoffman electric wire box & wire	4137 Warehouse	C	Y	
25	Anti-contamination suits	4137 Warehouse	A	Y	
26	Double bagged Contaminated 3' long Steel half pipe	4137 Warehouse	B	Y	
27	Filling Cabinet room 303 / FEP 0218	4137 Warehouse	C	Y	
28	Methanol bottle, Acetone bottle, and Empty plastic bottles	4137 Warehouse	C	Y	
29	Clock	4137 Warehouse	C	Y	
30	Scoop	4137 Warehouse	A	Y	
31	Air duct upstream of HEPA Filter Unit	4137 Warehouse	B	Y	
32	Probe inside duct upstream of HEPA Filter Unit	4137 Warehouse	B	Y	
33	HEPA Filter Unit	4137 Warehouse	B	Y	
34	Air duct downstream of HEPA Filter Unit	4137 Warehouse	C	Y	
35	Room 304 air duct support braces	4137 Warehouse	C	Y	
36	Room 303 Lg waste storage locker / FEP 0221	4137 Warehouse	C	Y	
37	55 gallon hot waste barrel	4137 Warehouse	C	Y	
38	Check source lock box / FEP 0212	4137 Warehouse	A	Y	
39	Alpha Spectroscopy detector / FEP 0215	4137 Warehouse	A	Y	
40	Computer / FEP 0217	4137 Warehouse	C	Y	
41	Computer Monitor and Keyboard / FEP 216	4137 Warehouse	C	Y	
42	Computer desk / FEP 0210	4137 Warehouse	C	Y	
43	Alpha Spec vacuum Pump sn 0282	4137 Warehouse	A	Y	
44	Count room steel Table / FEP 0013	4137 Warehouse	C	Y	
45	Ludlum 3030 detector sn 210769 / FEP 0210	4137 Warehouse	A	Y	

Note (1): Code: (A) Storage for Future Use. (B) Storage for subsequent disposal as Radioactive Material. (C) Unrestricted Release

USE ADDITIONAL SHEETS AS NECESSARY

International Isotopes Inc.

Potentially Contaminated Equipment Disposition Log

Page 3 of 3

No.	Item Name or Description / Serial Number	Location Transferred to	Code(1)	Survey Attached	
46	Ludlum 3030 detector sn 210766 / FEP 0211	4137 Warehouse	A	Y	
47	Stainless Steel Glove Box	4137 Warehouse	A	Y	

Note (1): Code: (A) Storage for Future Use. (B) Storage for subsequent disposal as Radioactive Material. (C) Unrestricted Release

USE ADDITIONAL SHEETS AS NECESSARY

I³ RADIOLOGICAL SURVEY REPORT

Contamination Survey Instrument Data

ID	Type	Serial #	Cal. Due	probe area (cm^2)	Eff.	Bkg count rate (cpm) Rb	Sample count time (minute) Ts	Bkg count time (minute) Tb	MDA (pCi)	Units
1	Ludlum 3030	210766	7/18/2013	N/A	1	7.9	1	1	7.2	/swipe
2	Ludlum 3030	210769	2/25/2014	N/A	1	6.5	1	1	6.7	/swipe
3	Ludlum 2360	202397	10/9/2013	100	0.2	10.95	1	1	41.4	/100cm2
4	Ludlum 2360	202409	9/4/2013	100	0.2	10.95	1	1	41.4	/100cm2

Radiation Survey Instrument Data

Type	Serial #	Cal. Due

$$MDA = \frac{3 + 3.29\sqrt{RbTs\left(1 + \frac{Ts}{Tb}\right)}}{efficiency \times Ts \times \frac{Probe\ Area\ (cm^2)}{100}}$$

Survey No.	Type (D, S, L)	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (pCi)	Units
1	D	3	External of ASTEC Monair Fume Hood	4	-6.95	-16	/100cm2
2	D	3	External of Plexiglas Glove Box	10	-0.95	-2	/100cm2
3	L	3	External of Plexiglas Glove Box	6	-4.95	-11	/LAW
4	L	3	Air Pump / sn 3109 / FEP 0199	2	-8.95	-20	/LAW
5	D	3	Air Pump / sn 3109 / FEP 0199	3	-7.95	-18	/100cm2
6	L	3	Thermal Anemometer / FEP 0205	2	-8.95	-20	/LAW
7	D	3	Alpha 7 CAM / sn 222	15	4.05	9	/100cm2
8	S	1	External of Post Reactor Filter Vessel	2	-5.9	-3	/swipe
9	D	3	External of Post Reactor Filter Vessel	4	-6.95	-16	/100cm2
10	S	1	External of Chemical Reactor	12	4.1	2	/swipe
11	D	3	External of Chemical Reactor	14	3.05	7	/100cm2
12	S	1	External of Chemical Reactor	10	2.1	1	/swipe
13	S	1	External of Chemical Reactor	10	2.1	1	/swipe
14	L	3	External of Chemical Reactor	2	-8.95	-20	/LAW
15	L	3	Chair / FEP 0200	2	-8.95	-20	/LAW
16	L	3	Foot Heat Sealer / #443 Singer Sealer	5	-5.95	-13	/LAW
17	D	3	Foot Heat Sealer / #443 Singer Sealer	10	-0.95	-2	/100cm2
18	L	3	HEPA Vacuum / sn 197913	2	-8.95	-20	/LAW
19	D	3	HEPA Vacuum / sn 197913	10	-0.95	-2	/100cm2
20	L	2	Stool / FEP 0194	1	-5.5	-2	/LAW
21	D	3	Stool / FEP 0194	3	-7.95	-18	/100cm2

Survey Types

D = Direct Scan
S = Swipe
L = Large Area Wipe

NOTES

1. Conversion Factor: **1 dpm = 0.45 pCi**
2. "Probe Area (cm^2)/100 cm^2" not used in MDA equation for Scalers.
3. A map is not required if sufficient detail can be included on this page.
4. Activity for direct (D) measurements corrected for probe area to 100 cm^2.
5. Swipes obtained over 100 cm^2 when the accessible surface area an item exceeds 100cm^2.
6. Ludlum 3030 instruments report results in units of dpm.
7. **Notify RSO when contamination levels exceed 45 pCi/100cm^2 in uncontrolled areas.**

I³ RADIOLOGICAL SURVEY REPORT CONTINUATION SHEET

Survey No.	Type (D, S, L)	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (μμCi)	Units
22	D	3	Old Flange and parts	10	-0.95	-2	/100cm2
23	D	3	Lab coats / 5 cloth coats	20	9.05	20	/100cm2
24	S	1	Movable Cabinet / counter top	20	12.1	5	/swipe
25	S	1	Movable Cabinet / inside top drawer	7	-0.9	0	/swipe
26	S	1	Movable Cabinet / inside 2nd drawer	15	7.1	3	/swipe
27	S	2	Movable Cabinet / inside 3rd drawer	2	-4.5	-2	/swipe
28	S	1	Movable Cabinet / inside 4th drawer	25	17.1	8	/swipe
29	D	3	Movable Cabinet / external surfaces	10	-0.95	-2	/100cm2
30	D	3	Wall mounted lock box / FEP 0203	10	-0.95	-2	/100cm2
31	S	1	Wall mounted lock box / FEP 0203	10	2.1	1	/swipe
32	D	3	Tube Furnace / FEP 0220	20	9.05	20	/100cm2
33	S	1	External of Tube Furnace Tube / bottom	28	20.1	9	/swipe
34	S	2	External of Tube Furnace Tube / side	8	1.5	1	/swipe
35	S	1	External of Tube Furnace Tube / side	28	20.1	9	/swipe
36	S	2	External of Tube Furnace Tube / side	10	3.5	2	/swipe
37	S	1	External of Tube Furnace Tube / side	12	4.1	2	/swipe
38	S	2	External of Tube Furnace Tube / top	10	3.5	2	/swipe
39	S	1	External of Tube Furnace Tube / middle	5	-2.9	-1	/swipe
40	S	2	External of Tube Furnace Tube / top	2	-4.5	-2	/swipe
41	D	3	External of Tube Furnace Tube / bottom	80	69.05	155	/100cm2
42	D	3	External of Tube Furnace Tube / middle	10	-0.95	-2	/100cm2
43	D	3	Air Pressure gauge and tubing	15	4.05	9	/100cm2
44	D	3	Hoffman electric wire box & wire	10	-0.95	-2	/100cm2
45	D	3	20 gallon Waste can	15	4.05	9	/100cm2
46	S	1	20 gallon Waste can bottom outer surface	10	2.1	1	/swipe
47	S	2	20 gallon Waste can bottom inner surface	16	9.5	4	/swipe
48	S	1	20 gallon Waste can Side inner surface	10	2.1	1	/swipe
49	S	2	20 gallon Waste can Side outer surface	5	-1.5	-1	/swipe
50	D	3	Wall mounted shelf	3	-7.95	-18	/100cm2
51	D	3	Box and Anticontamination suits	10	-0.95	-2	/100cm2
52	S	1	Top double bagged 3 ft. Steel half pipe	0	-7.9	-4	/swipe
53	S	2	Middle double bagged 3 ft.Steel half pipe	5	-1.5	-1	/swipe
54	S	1	Bottom double bagged 3 ft.Steel half pipe	5	-2.9	-1	/swipe
55	D	4	Filling Cabinet / FEP 0218	5	-5.95	-13	/100cm2
56	S	1	Top of Filling Cabinet	7	-0.9	0	/swipe
57	S	2	Side of Filling Cabinet	5	-1.5	-1	/swipe
58	S	1	Top Drawer of Filling Cabinet	2	-5.9	-3	/swipe
59	S	2	Bottom Drawer of Filling Cabinet	8	1.5	1	/swipe
60	L	4	Methanol Bottle	10	-0.95	-2	/LAW
61	D	4	Methanol Bottle	5	-5.95	-13	/100cm2
62	D	4	Clock	8	-2.95	-7	/100cm2
63	L	4	Clock	5	-5.95	-13	/LAW
64	D	4	Office Supplies	5	-5.95	-13	/100cm2
65	L	4	Office Supplies	8	-2.95	-7	/LAW
66	D	4	Scoop	6	-4.95	-11	/100cm2

I³ RADIOLOGICAL SURVEY REPORT CONTINUATION SHEET

Survey No.	Type (D, S, L)	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (μμCi)	Units
67	S	1	Scoop	10	2.1	1	/swipe
68	D	4	Acetone Bottle	10	-0.95	-2	/100cm2
69	D	4	Plastic Bottles	4	-6.95	-16	/100cm2
			Ventilation Duct in Room 304				
70	L	4	Inside East Section	120	109.05	245	/LAW
71	L	4	Inside West Section	60	49.05	110	/LAW
72	L	4	Outside East Section	10	-0.95	-2	/LAW
73	S	1	Inside East Section	221	213.1	96	/swipe
74	S	1	Outside Top Section	7	-0.9	0	/swipe
75	S	2	Inside Top section	338	331.5	149	/swipe
76	S	1	Outside bottom Section	15	7.1	3	/swipe
77	S	2	Inside Bottom Section	193	186.5	84	/swipe
78	S	1	East duct outside surface	12	4.1	2	/swipe
79	S	2	East duct outside surface	13	6.5	3	/swipe
80	S	1	East duct outside surface	5	-2.9	-1	/swipe
81	L	4	East duct outside surface	38	27.05	61	/LAW
82	D	4	West duct outside surface	20	9.05	20	/100cm2
83	S	1	West duct outside surface	5	-2.9	-1	/swipe
84	S	2	West duct outside surface	15	8.5	4	/swipe
85	S	1	West duct outside surface	5	-2.9	-1	/swipe
			Ventilation Duct on Mezzanine 402				
86	S	1	Inside Duct furthest from HEPA	160	152.1	68	/swipe
87	S	2	Inside Duct closest to HEPA	102	95.5	43	/swipe
88	S	1	Inside HEPA Unit ustream of filter	415	407.1	183	/swipe
89	S	2	Inside Duct closest to HEPA	150	143.5	65	/swipe
90	S	1	Inside HEPA Unit ustream of filter	612	604.1	272	/swipe
91	S	2	Probe inside Duct	155	148.5	67	/swipe
92	S	1	Floor Under HEPA	10	2.1	1	/swipe
93	S	2	Inside Duct downstream of HEPA filter	0	-6.5	-3	/swipe
94	S	1	Inside Duct downstream of HEPA filter	2	-5.9	-3	/swipe
95	D	4	Inside Duct downstream of HEPA filter	22	11.05	25	/100cm2
96	S	1	Inside Probe opening	5	-2.9	-1	/swipe
97	S	2	Deep inside probe opening	10	3.5	2	/swipe
98	S	1	Floor under probe opening	2	-5.9	-3	/swipe
99	D	4	Duct Braces	12	1.05	2	/100cm2
100	D	4	Lg storage locker / FEP 0221	12	1.05	2	/100cm2
101	D	4	55 gallon Hot Waste Barrel	28	17.05	38	/100cm2
102	S	1	55 gallon Hot Waste Barrel (outside)	15	7.1	3	/swipe
103	S	2	55 gallon Hot Waste Barrel (inside)	5	-1.5	-1	/swipe
104	S	1	55 gallon Hot Waste Barrel (bottom)	17	9.1	4	/swipe
105	D	4	55 gallon Cold Waste Barrel	12	1.05	2	/100cm2
106	S	1	55 gallon Cold Waste Barrel (outside)	12	4.1	2	/swipe
107	S	2	55 gallon Cold Waste Barrel (inside)	10	3.5	2	/swipe
108	S	1	55 gallon Cold Waste Barrel (bottom)	10	2.1	1	/swipe
109	D	4	Source Locke Box / FEP 0212	14	3.05	7	/100cm2
110	S	1	Source Locke Box / FEP 0212 (outside)	10	2.1	1	/swipe
111	S	2	Source Locke Box / FEP 0212 (inside)	2	-4.5	-2	/swipe

I³ RADIOLOGICAL SURVEY REPORT CONTINUATION SHEET

Survey No.	Type (D, S, L)	Inst. ID	Location or Item Description	Gross count rate (cpm)	Net count rate (cpm)	Activity (μμCi)	Units
112	S	1	Source Locke Box / FEP 0212 (bottom)	15	7.1	3	/swipe
113	D	4	Alpha spec detector / FEP 0215	12	1.05	2	/100cm2
114	S	1	Alpha spec detector / FEP 0215	7	-0.9	0	/swipe
115	D	4	Computer / FEP 0217	10	-0.95	-2	/100cm2
116	D	4	Computer Monitor & Keyboard / FEP 21	10	-0.95	-2	/100cm2
117	D	4	Computer Desk / FEP 0214	8	-2.95	-7	/100cm2
118	S	2	Keyboard	2	-4.5	-2	/swipe
119	S	1	Monitor	20	12.1	5	/swipe
120	S	2	Computer	2	-4.5	-2	/swipe
121	D	4	Alpha spec vacuum pump / sn 0282	10	-0.95	-2	/100cm2
122	S	1	Alpha spec vacuum pump / sn 0282	12	4.1	2	/swipe
123	D	4	Count Room Table / FEP 0209	13	2.05	5	/100cm2
124	S	1	Count Room Table / FEP 0209	17	9.1	4	/swipe
125	D	4	Count Room Rolling Chair / FEP 0013	12	1.05	2	/100cm2
126	D	4	Ludlum 3030 sn 210769 / FEP 0210	10	-0.95	-2	/100cm2
127	D	4	Ludlum 3030 sn 210766 / FEP 0211	10	-0.95	-2	/100cm2