**TITLE: ACQUISITION, HANDLING, TRACKING AND DISPOSAL OF Tritium EXIT SignS**

**PURPOSE:**

This Standard Operating Procedure (SOP) defines Radiological Health Department (RHD) processes related to the acquisition, handling, tracking and disposal of tritium EXIT signs.

**SCOPE:**

This SOP applies to all tritium EXIT signs in use at the University of Utah, including off-campus buildings owned and operated by the University. Tritium EXIT signs in buildings owned by other entities are not the responsibility of the University and are outside the scope of this SOP.

**POLICY:**

The University Radiation Safety Committee has directed that tritium EXIT signs are only to be used when no reasonable alternative is available. Prior approval from the University

Radiation Safety Officer (RSO) is required to purchase, replace, dispose, or use tritium EXIT signs.

The RHD is responsible for ensuring compliance with all regulatory requirements related to tritium EXIT signs. The RHD shall:

* maintain a complete listing of all tritium EXIT signs
* label all tritium EXIT signs with a unique identification number
* conduct, and document, an inventory of all tritium EXIT signs every 6 months
* maintain documentation of the inventory of tritium EXIT signs for 3 years after transfer or disposal of the tritium EXIT sign
* respond immediately to any report of a leaking or damaged tritium EXIT sign
* retrieve and store any unwanted tritium EXIT signs, pending disposal
* facilitate disposal by packaging and shipping tritium EXIT signs to an authorized facility, at the expense of the designee owner of the sign
* report to the State any tritium EXIT sign that is missing, damaged, or disposed

**REGULATORY REQUIREMENTS**

**State Regulations.** Tritium EXIT signs are generally licensed under State of Utah Administrative Code R313-21-22(4). Under these regulations, a licensee possessing or using a tritium EXIT sign must:

* not remove the labeling or radioactive symbol found on tritium EXIT signs
* not abandon tritium EXIT signs
* properly dispose of an unwanted tritium EXIT sign and report the disposal to the State within 30 days of disposal
* report to the State any lost, stolen or broken tritium EXIT sign
* inform the State of changes to the name or address of the general licensee or the person in charge of complying with the regulations
* not give away or sell tritium EXIT signs unless it is to remain in use at its original location; in such a case, the general licensee making the transfer must give the new owner a copy of the regulations and report the transfer to the State within 30 days of transfer

**License Conditions.** Line item 16 of the University Broadscope license UT18000001 requires the university to conduct physical inventories of all generally licensed sources.

**WORK INSTRUCTIONS:**

1. **Handling**
2. RHD personnel shall wear, at a minimum, a lab coat and gloves when handling tritium EXIT signs.
3. Dosimetry is not required to handle or be around tritium EXIT signs, unless those signs are in areas where dosimetry is already required.
4. If there is any question about the integrity of a tritium EXIT sign, a contamination survey must be conducted using wipes and liquid scintillation counting, to confirm no radioactive contamination, prior to handling or moving the sign.
5. Tritium EXIT signs shall be transported only in University vehicles and by placing the signs in clear, heavy-duty, polyethylene bags. If the vehicle is involved in an accident while transporting tritium EXIT signs, the RSO (801‐581‐6141) is to be immediately notified.
6. **Identification and Labeling**

When informed of new or recently discovered tritium EXIT signs:

1. Affix a Radiological Health internal tracking label to it (see Attachment A for an example of the label). The labels are sequential in nature.
	1. Affix the label in an area which will not interfere or disturb the function of the tritium EXIT signs.
	2. No parts of the "EXIT" letters, and no part of the manufacturers labeling, are to be obscured or covered by any label.
2. Record the serial number of the tritium EXIT signs, the INV# of the label attached, and the location of the sign.
3. Take close up photographs of the tritium EXIT signs showing the serial number and internal tracking label.
4. Indicate the location of the tritium EXIT signs on a building map or diagram that includes sufficient information to enable anyone to locate the sign. The diagram shall include the internal tracking number.
5. Tritium EXIT signs that are accessible should be labeled and photographed without any other assistance. Tritium EXIT signs that are only accessible with a ladder require the assistance of maintenance personnel.
6. Provide the collected information (serial number, location, map/diagram, photographs) to a Health Physicist (HP) for inclusion in the appropriate information tracking system.
7. An HP shall contact the appropriate District Manager in Facility Operations and inform them of the tritium EXIT sign location. (See Attachment B for a list of current District Managers and the Buildings they are over.)
8. **Inventory**
9. Each tritium EXIT sign shall be entered into HP Assist in the “General Licensed” category
	1. Include Make, Model, Serial number, Location, appropriate District Manager, and matching Inventory Label number
	2. Complete all pertinent information for each tritium EXIT sign entered

NOTE: Generally licensed isotope activity is not counted towards any Specific license radionuclide inventory limits.

1. Tritium EXIT signs are to be inventoried every six months. To conduct the inventory:
	1. Print out a report from HP Assist indicating the tritium EXIT sign inventory by building
	2. Contact the Facility Operations District Manager for each building to arrange a time to conduct the inventory
	3. In coordination with the District Manager or his designee, conduct a physical inventory, verifying the location and integrity of each tritium EXIT sign
	4. Update HP Assist to indicate the date of the inventory and correct any noted discrepancies
	5. Provide a copy of the verified building inventory to the appropriate District Manager and HP
	6. Contact the RSO immediately if any tritium EXIT sign is damaged or missing
2. **Response to Missing/Damaged Signs**
3. If you are contacted about a broken tritium EXIT sign:
	1. Gather contact information from the caller as well as the specific location of the damaged tritium EXIT sign.
	2. Ask the individual to please ventilate the room, if feasible, and then to leave the area asking others in the area to leave as well.
	3. Instruct them to, as soon as possible, wash their face and hands with warm water and gentle soap, but not harshly scrub the skin.
	4. Do not instruct them to attempt to clean up the tritium EXIT sign or the surrounding area.
	5. Inform the RSO about the missing/damaged tritium EXIT sign.
4. An available analyst and HP shall immediately respond to the location with an emergency response kit and follow RHD spill procedures.
5. A report of missing and/or damaged signs must be submitted by the RSO to the State of Utah. An example letter is included in Attachment C.
6. **Disposal and Reimbursement of Cost**
7. Tritium EXIT signs to be disposed are to be picked up, or delivered to, the Radiological Health Department, Building 590.
	1. Upon pickup or delivery, the owner of the tritium EXIT sign should be informed that a disposal cost of approximately $150 per sign will be charged to their organization.
	2. Tritium EXIT signs that are picked up should only be transported in University vehicles and by placing the signs in clear, heavy-duty, polyethylene bags. If the vehicle is involved in an accident while transporting tritium EXIT signs, the RSO (801‐581‐6141) is to be immediately notified.
	3. Tritium EXIT signs shall be appropriately surveyed either before transporting or immediately after arriving at Bld. 590.
8. All tritium EXIT signs are to be stored at the Waste Facility (building 590) in the cabinet located at the far North-East end of the waste storage area.
	1. The inventory sheet on the outside of the storage cabinet shall be updated any time tritium EXIT signs are put in or taken out of the cabinet.
9. Update HP Assist to reflect the location of the tritium EXIT signs (Bld. 590)
	1. Tritium EXIT signs not currently in the inventory should be entered.
	2. Picked up tritium EXIT signs that are currently in the database should be transferred to possession of the RSO permit.
10. Disposal arrangements are made by an HP through an authorized disposal company.
	1. Tritium EXIT signs should be disposed promptly, typically within 6 months of receipt
	2. Contact the following company to receive a quote for disposal:

SRB Technologies Inc.
[www.srbtechnologies.com](http://www.srbtechnologies.com)
1-800-552-0098

* 1. A complete quote, including shipping, of the disposal costs of the tritium EXIT signs should be obtained within 15 days of pick up.
	2. This quote is then forwarded to the Administrative Assistant of the Radiological Health Department, along with any necessary information regarding reimbursement. (Including contact information for those fiscally responsible for the disposal costs.)
	3. The Administrative Assistant will arrange for reimbursement of all disposal costs and will notify the HP when paid.
1. An HP shall follow the instructions from the authorized disposal company regarding packaging and shipment of tritium EXIT signs.
2. Once tritium EXIT signs are disposed they are removed from the database.
3. Following shipment, a letter must be prepared by the RSO and sent to the State of Utah regulatory agency, within 30 days, reporting the disposition of the tritium EXIT signs once the signs are received by the disposal company. An example letter is included in Attachment D.

**ATTACHMENT A**

**Inventory Sticker**

Below is a picture of an inventory sticker used to track tritium EXIT signs. The stickers are uniquely numbered and are sequential. The stickers can be obtained by speaking to the RSO, HP or the Radiation Analyst assigned to inventory the tritium EXIT signs.

**ATTACHMENT B**

**Current List of District Managers and the Buildings They Oversee**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
|  | **Zone 1: President's Circle** |  | **Zone 3: Athletics, Auxiliary, Venue** |  |
|  | Dana Johnson 801-581-5609 |  | Andrew Brauzer  801-581-4472 |  |
|  | 1 | John R. Park Building | PARK |  | 30 | Cauldron Legacy Plaza VC | Plaza |  |
|  | 2 | Voice & Opera Center | VOICE |  | 32 | Rice-Eccles Stadium | STAD |  |
|  | 3 | David P. Gardner Hall | DGH |  | 33 | Clark Football Center | CFC |  |
|  | 4 | Joseph T. Kingsbury Hall | KH |  | 90 | Jon M. Huntsman Center | JHC |  |
|  | 6 | William Stewart Building | ST |  | 91 | HPER East | HPR E |  |
|  | 8 | Alfred C. Emery Building | AEB |  | 92 | HPER North | HPR N |  |
|  | 9 | John A. Widtsoe Building | JWB |  | 93 | HPER Natatorium | HPRNAT |  |
|  | 10 | Physics Building (South) | PHYS |  | 94 | HPER West | HPR W |  |
|  | 13 | LeRoy E. Cowles Building | LCB |  | 97 | Dumke Gymnastics Center | DGC |  |
|  | 14 | James Talmage Building | JTB |  | 98 | Burbidge Athletics-Academic Center | KBAC |  |
|  | 19 | Intermountain Network Scientific CC | INSCC |  | 99 | Huntsman Basketball Training Center | HBF |  |
|  | 40 | Student Services Building | SSB |  | 109 | Softball Stadium | DFSS |  |
|  | 43 | Naval Science Building | NS |  | 110 | Student Life Center | SLC |  |
|  | 66 | Simmons Pioneer Memorial Theatre | PMT |  | 111 | Track and Field Storage Building |   |  |
|  | 70 | S. J. Quinney College of Law | COL |  | 119 | Legacy Bridge | BRIDGE |  |
|  | 72 | Building 72 |   |  | 130 | Cauldron | Cauld |  |
|  | 73 | Building 73 |   |  | 197 | Rosenblatt Home | Rosen |  |
|  | 83 | Fletcher Physics | JFB |  | 198 | Eccles House | EH |  |
|  | 124 | Building 124 |   |  | 205 | George S. Eccles Tennis Center | GETC |  |
|  | 170 | Fine Arts West | FAW |  | 206 | Outdoor Tennis Complex |   |  |
|  |  |  |  |  | 210 | Eccles Football Center | SCEFC |  |
|  | **Zone 2: Sciences** |  | 212 | Spence Eccles Field House | SEFH |  |
|  | Sarah Boll  801-581-6772 |  | 213 | Library Storage | Lib Sg |  |
|  | 5 | George Thomas Building | GTB |  | 215 | Shop Building | Shop |  |
|  | 7 | Life Sciences | LS |  | 216 | Ski Building | SKI BLDG |  |
|  | 17 | Performing Arts | PAB |  | 327 | PPO Greenhouse | PPO GH |  |
|  | 25 | Social & Behavioral Science | BEH S |  | 590 | Regulated Waste Management Facility | RWMF |  |
|  | 26 | College of Social Work | SW |  | 601 | UMC House |   |  |
|  | 27 | SBS Lecture Hall | S BEH |  | 602 | Fort Douglas Duplex |   |  |
|  | 28 | Marriott Center for Dance | MCD |  | 603 | Fort Douglas House (Interfaith) |   |  |
|  | 29 | Einar Nielsen Fieldhouse | FLD H |  | 604 | Pierre Lassonde Entrepreneur Center | PLEC |  |
|  | 44 | Office Building |   |  | 605 | Environmental Health & Safety | EH & S |  |
|  | 82 | Aline Wilmot Skaggs Biology | ASB |  | 615 | Alliance House |   |  |
|  | 84 | Biology | BIOL |  | 618 | Fort Douglas Triplex |   |  |
|  | 85 | Eyring Chemistry | HEB |  | 619 | Honors Center |   |  |
|  | 87 | Thatcher Chemistry | TBBC |  | 622 | American Indian Resource Center | AIRC |  |
|  | 126 | Biology/Theatre Storage | BTS |  | 624 | Auxiliary Services Office |   |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | ***Zone 3 (Continued)*** |  | **Zone 5: Academic** |  |
|  | Andrew Brauzer  801-581-4472 |  | John Palo  801-585-6684 |  |
|  | 627 | Surplus Property |   |  | 35 | Museum of Fine Arts | UMFA |  |
|  | 634 | Fort Douglas Bandstand | FD 634 |  | 36 | Film and Media Arts | FMAB |  |
|  | 638 | Fort Douglas PX |   |  | 37 | Architecture Building | ARCH |  |
|  | 644 | Fort Douglas PO Shops |   |  | 38 | Art Building | ART |  |
|  | 645 | Fort Douglas Storage |   |  | 39 | Sculpture | SCULPT |  |
|  | 650 | Ft Douglas Bath House | OR |  | 45 | Irish Humanities Building | CTIHB |  |
|  | 652 | LEAP | LEAP |  | 49 | Languages & Communication | LNCO |  |
|  | 653 | Fort Douglas House |   |  | 54 | Orson Spencer Hall | OSH |  |
|  | 659 | Fort Douglas Public Safety |   |  | 65 | Milton Bennion Hall | MBH |  |
|  | 840 | Dentistry | UUSOD |  | 71 | Sorenson Arts & Education Complex | SAEC |  |
|  | 846 | Richard K. Hemingway Orangerie | Orange |  | 74 | Business Classroom Building | BU C |  |
|  | 849 | Red Butte Cottam Visitor's Center | CVC |  | 77 | C Roland Christensen Center | CRCC |  |
|  | 853 | Dumke Health Professions | HPEB |  | 79 | Spencer Fox Eccles Business | SFEBB |  |
|  | 872 | Natural History Museum of Utah | NHMU |  | 86 | J. Willard Marriott Library | M LIB |  |
|  |  |  |  |  | 105 | Annex | ANNEX |  |
|  | **Zone 4: Engineering** |  | 171 | Bicycle Cooperative | BIKE |  |
|  | Ken Hart  801-587-1115 |  | 301 | Public Safety | Safety |  |
|  | 11 | William C. Browning Building | WBB |  | 305 | Physical Plant Services | PP Ser |  |
|  | 12 | Frederick Albert Sutton Building | FASB |  | 306 | Buildings & Grounds | Blg/Gr |  |
|  | 51 | Sill Center | SILL |  | 308 | Recycling | RECYCL |  |
|  | 52 | Alumni House | ALUMNI |  | 309 | Motor Pool | Motor |  |
|  | 56 | Civil and Materials Engineering | CME |  | 350 | University Services Building | VRTUSB |  |
|  | 57 | Hedco | HEDCO |  |  |  |  |  |
|  | 58 | Mineral Processing Lab | MPL |  | **Zone 6: Health Sciences** |  |
|  | 59 | Mining Systems Research Lab | MSRL |  | Joseph Ashurst  801-581-6254 |  |
|  | 60 | Experimental Studies Building | ESB |  | 500 | Nora Eccles Harrison CVRTI | CVRTI |  |
|  | 61 | Meldrum Civil Engineering Building | MCE |  | 512 | Research Administration | RAB |  |
|  | 62 | Warnock Engineering Building | WEB |  | 533 | Eccles Institute of Human Genetics | EIHG |  |
|  | 64 | Merrill Engineering Building | MEB |  | 565 | E. E. Jones Medical Science | EEJMRB |  |
|  | 108 | Golf Shop | Glf Sh |  | 570 | Biomedical Polymers Research | BPRB |  |
|  | 151 | Sorenson Molecular Biotechnology | SMBB |  | 575 | Health Sciences Education Building | EHSEB |  |
|  | 179 | Eccles Broadcast Center | EBC |  | 581 | Skaggs Research | SRB |  |
|  | 180 | Space Planning & Management | Space |  | 582 | Skaggs Pharmacy | SK H |  |
|  | 184 | Sponsored Projects | S Proj |  | 585 | Building 585 | RB LAB |  |
|  | 372 | Kennecott Mechanical Engineering | MEK |  | 586 | Building 586 | RB ADM |  |
|  |  |  |  |  | 587 | Building 587 |   |  |
|  |  |  |  |  | 588 | Nursing | CNB |  |
|  |  |  |  |  | 589 | Eccles Health Sciences Library | Eccles |  |

**ATTACHMENT C**

**Example Letter Notifying the State of Utah of a Lost or Damaged Tritium EXIT Sign**

<Date>

<Name>, Director

Utah Department of Environmental Quality

Division of Waste Management and Radiation Control
<Address>

Subject: Report of Missing/Damaged Tritium Exit Sign

On <Date>, a telephone call from our department was made to <Name> to report that a self-luminous exit sign containing tritium (H-3), was missing/damaged. This telephone call was made to fulfill the requirement found in R313-15-1201(1). This letter is to follow up that phone call with a written report as required by R313-15-1201(2).

The sign, <model>, <serial#>, was manufactured by the company <Company Name>, <Date of manufacture>. At the time of manufacture, it contained no more than <Activity> of gaseous tritium. The University of Utah purchased the sign from <Company Name & Address>.

At the time of the prior physical inventory, <Date>, the sign contained, due to radioactive decay, no more than <Activity> of tritium. The sign was installed at <Location & Address>. The sign was discovered to be missing/damaged on <Date>, by an employee of my office, who was conducting a physical inventory of all tritium exit signs.

<Narrative of circumstances leading to missing/damaged signs. Include recovery attempts and/or surveys conducted along with results.>

<Narrative of final known or probable disposition. Include possibilities.>

The Annual Limit on Intake (ALI), as found in EPA Federal Guidance Report No. 11, for tritium is 80 mCi for either an ingestion or inhalation dose, which would result in a 5 rem Total

Effective Dose Equivalent (TEDE). An ingestion of <Activity> of tritium, either by inhalation or ingestion would result in a TEDE of <Dose>, however, an inhalation of all the gas contained in the missing/damaged sign, is extremely unlikely. I am unaware of any circumstance in which an exposure to any individual, due to this missing/damaged sign, occurred.

Sincerely,

<RSO Name>
Director, Radiation Safety Officer

Cc: University of Utah Radiation Safety Committee

 <Name>, Vice President for Research

 <Necessary Additions>

**ATTACHMENT D**

**Example Letter Notifying the State of Utah of Disposed Tritium EXIT Signs**

<Date>

<Name>, Director

Utah Department of Environmental Quality

Division of Waste Management and Radiation Control
<Address>

Subject: Report of Disposition of Tritium Exit Signs

On <Date> the following tritium Exit signs were confirmed to be received for disposal by <Disposal Company>:

<List of Make, Model and Serial#’s>

The University of Utah is no longer in possession of these signs. Please do not hesitate to contact my office with any questions.

Sincerely,

<RSO Name>
Director, Radiation Safety Officer

Cc: University of Utah Radiation Safety Committee

 <Name>, Vice President for Research

 <Necessary Additions>

**SUPPORT DOCUMENTS:**

Tritium Exit Signs Fact Sheet 1-2017, Revision 0.

**REVISION HISTORY:**

|  |  |  |
| --- | --- | --- |
| **Rev. #** | **Revision Date** | **Changes from previous revision** |
| 0 | 3/3/2017 | Original procedure. |

|  |  |  |
| --- | --- | --- |
| **Mario A. Bettolo** |  | 3/3/2017 |
| QA Manager Name | QA Manager Signature | Date |

|  |  |  |
| --- | --- | --- |
|  |  | Click here to enter a date. |
| RSO Name | RSO Approval Signature | Date |