Fermilab

# RADIOLOGICAL CLEARANCE FORM

**NOTE: This form must be completed for impacted M&E submitted for clearance. This form does not need to be completed for clearance of non-impacted items that: (1) originate from outside of a radiologically posted area, (2) have never been in a radiologically posted area during beam-on conditions, (3) have never contacted potentially contaminated/dispersible material, or (4) otherwise have no potential for containing radioactivity above background levels.**

M&E is to be released without restrictions:

- ☐ To the general environment or community for unrestricted reuse
- ☐ For scrap metal recycling
- ☐ For disposal or potential disposal to a landfill or facility at which radioactive material is prohibited
- ☐ Other:

Description of M&E (List location, material type, size, weight, etc. Attach additional documentation if necessary.)

Release ID: _____ Previous Release ID (if any): _____

Process Knowledge

Previous Posting: Controlled Area ☐ RMA ☐ RA ☐ HRA ☐ RBA ☐ Contamination Area ☐ Unknown ☐
Other ☐ _____

Current Posting: Controlled Area ☐ RMA ☐ RA ☐ HRA ☐ RBA ☐ Contamination Area ☐
Other ☐ _____

Activation possible? NO ☐ YES ☐ Contamination possible? NO ☐ YES ☐ Is liquid present or a part of the item(s)? NO ☐ YES ☐ → ***If YES, contact Rad Safety***

Survey Data (to be completed by the RCO)

**Impacted Area Classification (select all that apply): Level 1 ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐**

Potential Radionuclides: _____

| **Survey Type** | **Required?** | **Serial Numbers (Instrument + Detector)** | **Cal Due Date** | **Bkgd CPM** | **Net Counts on Item** |
|---|---|---|---|---|---|
| Volumetric<br>☐ Bicron Analyst | ☐ Yes<br>☐ No | ☐ Battery Check OK<br>☐ Source Check OK | | | CPM |
| Total Surface Contamination<br>☐ Ludlum 177-4 w/44-9<br>☐ Eberline E-140N w/44-9 | ☐ Yes<br>☐ No | ☐ Battery Check OK<br>☐ Source Check OK | | | CPM<br>÷ 0.019<br>$\frac{\text{DPM}}{100\ \text{cm}^2}$ |
| Removable<br>Surface Contamination<br>☐ XLB ☐ LSC ☐ HPGe | ☐ Yes<br>☐ No | RAF Batch ID or Work Request No.: _____<br>*Attach Results from RAF* | | | |
| Confirmatory Measurements | ☐ Yes<br>☐ No | ☐ Portal Gate Monitor<br>☐ HPGe Gamma Spectrometry | | | |

Surveyed By: Fermilab ID: Date:

Final Approval (Clearance of items must be approved by assigned RSO or designee)

**DECISION ☐ Meets criteria for Clearance ☐ Does NOT meet criteria for Clearance**

Approved by: Fermilab ID: Date:

Fermilab

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*Impacted Area Classifications*

| | |
|---|---|
| **Level 1** | Areas containing M&E known to have or have had surface contamination or volumetric activation, based on process knowledge or previous radiological surveys, or both. Examples include areas near normal beam loss points, such as beam absorbers, septa, collimators, and targets. |
| **Level 2** | Areas that have or have had at least a potential for surface contamination or volumetric activation, based on process knowledge, previous radiological surveys, or both. Examples include M&E located adjacent to Level 1 areas and any area or system handling radioactive effluent. |
| **Level 3** | Areas that have or have had a minimal potential for surface contamination or volumetric activation based on process knowledge or previous radiological surveys, or both. Examples include areas that have had no beam losses or preliminary area surveys showed no induced radioactivity. |
| **Level 4** | Areas where $^{3}H$ or $^{7}Be$ contamination is suspected. |

*Background-dependent detection thresholds for IFB determination of volumetric radioactivity*

| **Background (cpm)[1]** | **IFB Detection Threshold (net cpm)** | **Background (cpm)[1]** | **IFB Detection Threshold (net cpm)** | **Background (cpm)[1]** | **IFB Detection Threshold (net cpm)** |
|---|---|---|---|---|---|
| 1000 | **147** | 1700 | **191** | 2400 | **227** |
| 1100 | **154** | 1800 | **197** | 2500 | **232** |
| 1200 | **161** | 1900 | **202** | 2600 | **237** |
| 1300 | **167** | 2000 | **207** | 2700 | **241** |
| 1400 | **173** | 2100 | **213** | 2800 | **246** |
| 1500 | **180** | 2200 | **218** | 2900 | **250** |
| 1600 | **186** | 2300 | **223** | 3000 | **254** |

*[1]If between values, round down*

*Release Criteria for Surface Contamination*

| **Radionuclides** | **REMOVABLE** (dpm/100 $cm^2$) | **TOTAL** (Fixed + Removable) (dpm/100 $cm^2$) | |
|---|---|---|---|
| | | **Average** | **Maximum[a]** |
| Group 1—Transuranics, $^{125}I$, $^{129}I$, $^{227}Ac$, $^{226}Ra$, $^{228}Ra$, $^{228}Th$, $^{230}Th$, $^{231}Pa$ | 20 | 100 | 300 |
| Group 2—Th-natural, $^{90}Sr$, $^{126}I$, $^{131}I$, $^{133}I$, $^{223}Ra$, $^{224}Ra$, $^{232}U$, $^{232}Th$ | 200 | 1,000 | 3,000 |
| Group 3—U-natural, $^{235}U$, $^{238}U$, associated decay products, alpha emitters | 1,000 | 5,000 | 15,000 |
| Group 4—Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except $^{90}Sr$ and others noted above | 1,000 | 5,000 | 15,000 |
| Tritium and STCs (applicable to surface and subsurface) | 10,000 | N/A | N/A |

*[a]* For unique circumstances, such as valuable equipment, the "Maximum" Total column value may be used with written approval from the SRSO when the contamination is localized to an area of not more than 100 $cm^2$.