



**Alcoa Technology**

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Licensing Assistance Team  
Division of Nuclear Materials Safety  
U.S. Nuclear Regulatory Commission, Region 1  
475 Allendale Road  
King of Prussia, PA 19406-1415

**CERTIFIED MAIL**

**Reference: Request to Terminate Portions of License No. 37-07653-02**

03006172

Dear Sir or Madam:

Alcoa Inc. respectfully requests the Commission remove the Alcoa Research Laboratory (ARL) located at 600 Freeport Road, New Kensington, PA 15068 from item 10 in the referenced NRC License. As stated in a previous letter dated February 10, 2004, Alcoa Inc. has ceased operations at the ARL facility. Operations will continue under this license at the Alcoa Technical Center, 100 Technical Drive, Alcoa Center, PA 15069.

After removal of all licensed material from the site, Alcoa Inc. contracted a third party, Philotechnics, Ltd., to perform characterization and final status surveys of the facility. All surveys were performed in accordance with the protocols and guidelines established in NUREG 1757, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Philotechnics has extensive experience with MARSSIM and has released numerous facilities over the years. The final status survey was performed in August, 2004.

Title 10, Code of Federal Regulations, Part 20, Subpart E specifies the radiological criteria for release of a site for unrestricted use and termination of License. For facilities such as the ARL, the criteria are (a) residual radioactivity that is distinguishable from background results in a TEDE to an average member of the critical group that does not exceed 25 mrem per year, and (b) residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Results of surveys performed indicate the residual contamination levels from all radionuclides are less than the default screening values for the most limiting radionuclides present: Am-241 for alpha emitters and Co-60 for beta-gamma emitters.

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**NMSS/RGNI MATERIALS-002**

Nuclear Materials Safety Branch  
Division of Nuclear Materials Safety  
U.S. Nuclear Regulatory Commission, Region 1  
2005 June 21  
Page 2

These surveys demonstrate the TEDE to an average member of the critical group will be less than 25 mrem per year. Additional steps were taken to decontaminate several small areas of elevated fixed Cs-137 contamination, resulting in residual radioactivity levels that are ALARA. Therefore the unrestricted release criteria have been met.

A copy of the Final Status Survey Plan and Report is enclosed for your review. Should you have any questions or require additional information, please do not hesitate to contact me at 724-337-4056 or by email at [ed.peace@alcoa.com](mailto:ed.peace@alcoa.com).

Sincerely,



Johan E. Peace  
Radiation Safety Officer  
Alcoa Technical Center

JEP/pag  
Enclosure

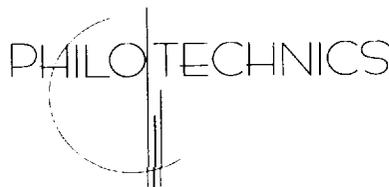
cc: NRC Amendment File

# **Final Status Survey Plan And Report**

**Alcoa Research Laboratory**

**600 Freeport Rd.  
New Kensington, PA 15068**

**Prepared by:**



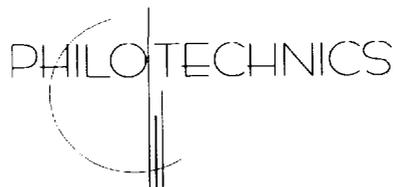
**Philotechnics, Ltd.  
118 Mitchell Road  
Oak Ridge, TN 37830**

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## 1.0 Introduction

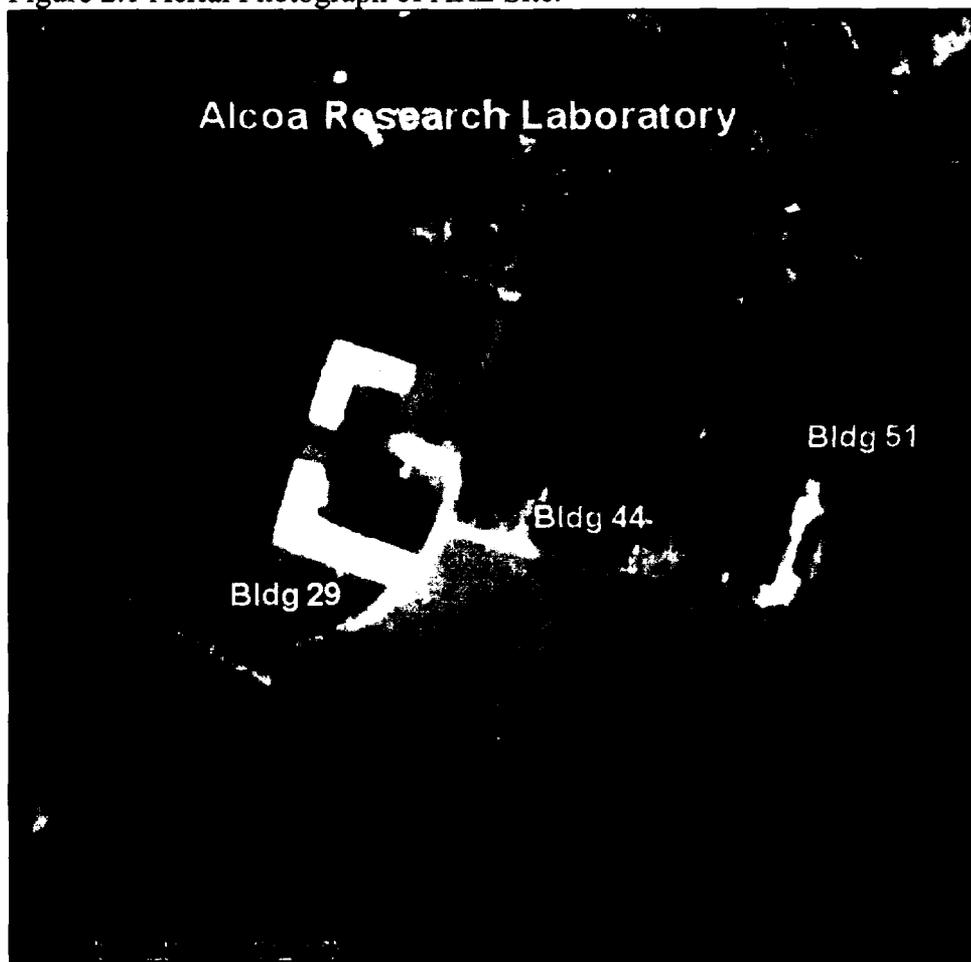
The Alcoa Research Laboratory (ARL) is a 14.126 acre site located at 600 Freeport Rd, New Kensington, PA 15068. The site formerly served as both a research center for aluminum applications and production as well as the headquarters for Alcoa research operations throughout the world. The facility is licensed under US NRC license number 37-07653-02 (docket number 030-06172).

The site is comprised of three principal buildings: Building 29, Building 44 and Building 51. The building number corresponds to the year that the structure was built (e.g., Building 29 was constructed in 1929). During the late 1950's and through the mid 1960's the facility conducted limited research activities with byproduct material. These activities were primarily in the form of tool wear studies and irradiated coupon investigations. Use of unsealed radioactive material at the ARL had ceased by 1970. The ARL facilities in which unsealed licensed material was used were surveyed to confirm the absence of any residual radioactivity and were removed from the facility license in 1971. In 1978 the ARL was added back onto the radioactive materials license for storage of sealed sources. At this time Alcoa desires to remove the facility from their radioactive materials license. This document describes the licensing history and disposition of radioactive materials. It also describes the confirmatory surveys performed and presents the survey results to support removing the facility from the radioactive materials license.

## 2.0 Site Description

The ARL is located at 600 Freeport Road in New Kensington, PA. The site is located in an area that is primarily urban residential in nature comprised of three principal structures, Buildings 29, 44 and 51. An aerial photograph of the site is provided in Figure 2.1.

Figure 2.1 Aerial Photograph of ARL Site.



The building number corresponds to the year that the structure was built (e.g., Building 29 was constructed in 1929). During the late 1950's and through the mid 1960's the facility conducted limited research activities with byproduct material. Radioactive materials were used in a series of laboratories in the mezzanine of Building 44. A drawing of Building 44 laboratory arrangement is provided in Figure 2.2. Laboratory photographs are presented in Appendix E. The mezzanine laboratory area is approximately 2,400 ft<sup>2</sup> in size. These activities were primarily in the form of tool wear studies, irradiated coupon investigations,

and sealed source storage. Use of unsealed radioactive material at the ARL had ceased by early 1971.<sup>1,2,3</sup> The ARL facilities in which unsealed licensed material was used were surveyed to confirm the absence of any residual radioactivity and were removed from the facility license in 1971.<sup>4,5</sup> In 1978 the ARL was added back onto the radioactive materials license for storage of sealed sources.<sup>6,7</sup>

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<sup>1</sup> Letter from R. C. Geiger, RSO Alcoa to R. Brinckman, US AEC, March 8, 1971 Requesting guidance on clearance surveys. Copy in Appendix A to this report.

<sup>2</sup> Reply from R. Brinckman, US AEC to R.C. Geiger, Alcoa, March 23, 1971. Requesting additional information on new facilities and providing closeout survey guidance. Copy in Appendix A.

<sup>3</sup> Letter from R. A. Kramer, Sr. Research Scientist, Alcoa to R. Brinckman, US AEC, April 28, 1971 describing new research facilities at Alcoa Technical Center. Copy in Appendix A.

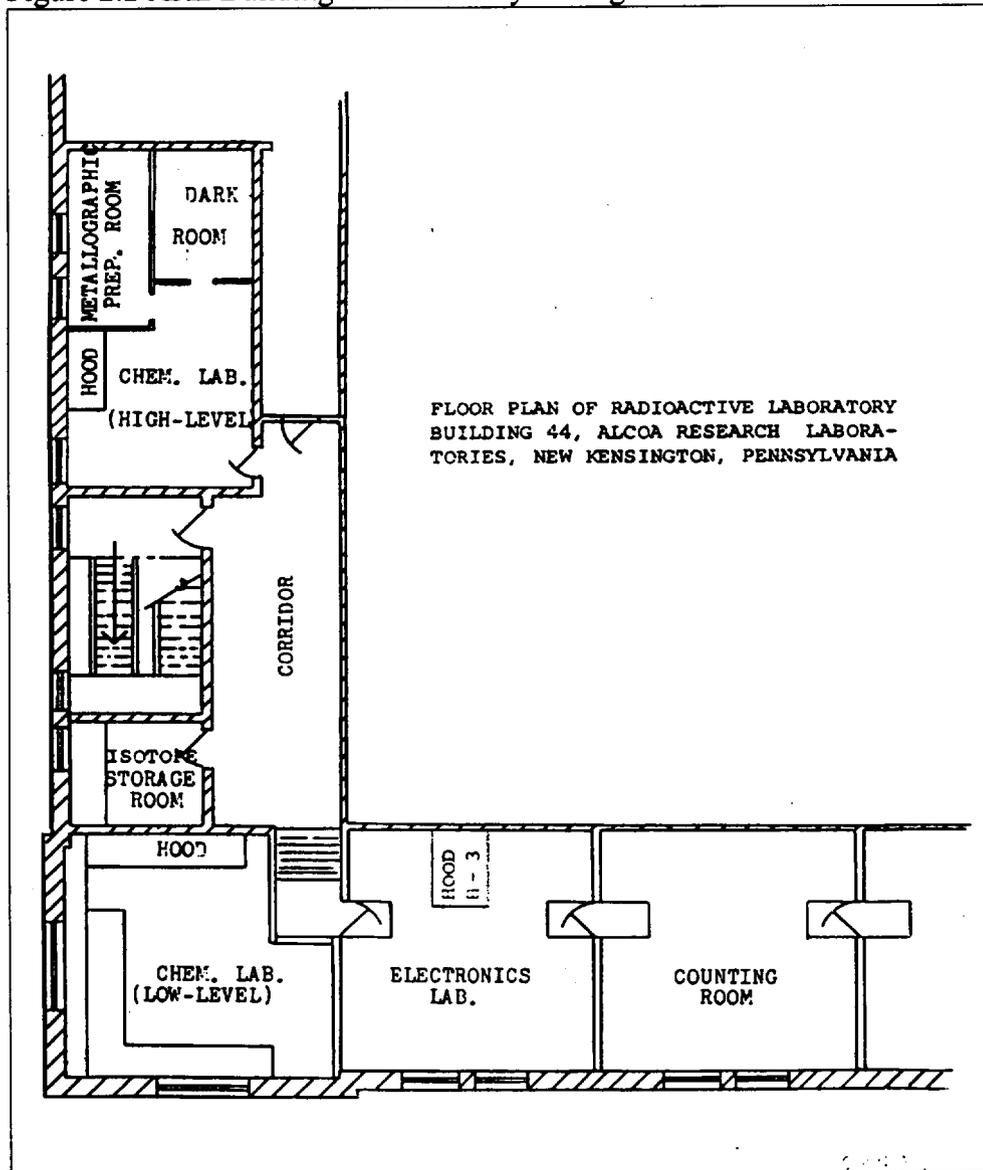
<sup>4</sup> Letter from R.C. Geiger, Alcoa to Director, Division of Material Licensing, US AEC, June 18, 1971 Closeout survey report. Copy in Appendix A.

<sup>5</sup> License Amendment 26 to 37-07653-02. Dated July 15, 1971 removing the ARL from the license. Copy in Appendix A.

<sup>6</sup> Letter from R.C. Geiger, Alcoa to G. Kligfield, Radioisotope Branch, US NRC, July 21, 1978, Providing supplementary information for license renewal application. Copy in Appendix A.

<sup>7</sup> License Amendment 35 to 37-07653-02. Dated October 6, 1978 adding the ARL back onto the license for sealed source storage. Copy in Appendix A.

Figure 2.2 ARL Building 44 Laboratory Arrangement



### 3.0 Radioactive Materials Stored

Although records were maintained of the disposition of sources that were stored at the ARL and leak tests were performed and the associated leak test records were maintained, a complete record of all source transfers to and from the source storage area was not maintained. Furthermore, source storage and removal activities took place some 20 to 30 years ago. Consequently, although fairly good records concerning leak tests exist, they are not considered complete. As a result, the ARL is considered a Group 2 Decommissioning per the classification system contained in NUREG-1757, "Consolidated NMSS Decommissioning Guidance". Group 2 includes those "...licensees who possess and use only sealed sources that cannot demonstrate current leak-tight integrity..."

Per NUREG-1757 the licensee should first identify any areas in the facility that were involved in licensed material use by reviewing facility records and conducting a survey of the licensed material use area. This survey should be similar to the routine contamination surveys conducted under the licensee's radiological safety plan.

NUREG 1757 also permits the use of a "Simplified Survey Procedure" for Group 2 decommissioning projects. The Simplified Survey Procedure states:

*In preparing for the FSS, the licensee should establish a method to identify individual measurement/sampling points on each surface in the indoor area that was involved in licensed material use. At a minimum, the licensee's survey should consist of the following:*

- *One hundred percent scans of all surfaces in the area of the facility where licensed material was used or stored, using an appropriate radiation detection instrument (including scan sensitivity);*
- *Evaluation for total and removable radioactive material at each area exhibiting elevated radiation levels, or at a frequency of one wipe comprising 100 cm<sup>2</sup> per 300 ft<sup>2</sup>; and*
- *Evaluations of radiation levels at one meter above surfaces.*

*Particular attention should be afforded any drains, air vents, or other fixtures or equipment that may have become contaminated during licensed material use. This is especially significant in situation where renovations have occurred and potentially contaminated areas may be inaccessible under current conditions.*

The use of radioactive materials at the ARL was reviewed over the entire history of the facility. This review included interviews with knowledgeable individuals, review of license amendments, periodic inspection reports, and correspondence

between the US NRC and Alcoa. From 1978 on, the sealed source isotopes that were licensed to be stored at the ARL are listed in Table 3.1

Table 3.1 Radioactive Material Authorized for Storage at the ARL

Isotope	Default Screening Value Building Surfaces dpm/100cm <sup>2</sup>	DSV Source	Primary Emission
Cs-137	2.8E4	NUREG 1757	β,γ
Sr-90	8.7E3	NUREG 1757	β
Co-60	7.1E3	NUREG-1757	β,γ
Ni-63	1.6E6	DandD <sup>1</sup>	β
H-3	1.2E8	NUREG 1757	Low Energy β
Am-241	24	DandD <sup>1</sup>	α
Kr-85	N/A <sup>2</sup>	N/A	N/A
Tl-204	~5E5	Not supported in DandD <sup>3</sup>	β
Pm-147	3.0E5	DandD <sup>1</sup>	β

<sup>1</sup> DandD, version 2.1 – Code Output is presented in Appendix B.

<sup>2</sup> Kr-85 is a non-reactive noble gas. It will not be present on surfaces.

<sup>3</sup> Although Tl-204 is not supported in the DandD code, its emissions and energies are similar to Cl-36. In addition, oral ingestion and occupational inhalation ALIs are the same (2E3 uCi) for clearance class D chlorine compounds and thallium (all Tl compounds are class D). The DSV for Cl-36 is 5E5 dpm/100 cm<sup>2</sup>. This is a reasonable approximation of the expected DSV for Tl-204. The limiting radionuclide with respect to survey design is Co-60 for beta emitters.

The Am-241 was contained in special form capsules in three Troxler Model 2401 density gauges and one Campbell Pacific Nuclear Model MC-1-1225 density gauge. The Campbell Pacific gauge was a rental for a three month period in 1983 - 1984. The Troxler gauges were returned to the manufacturer in December 1983 (ser. nos. 3133 and 3145) and May 1985 (ser. no. 1739). They were removed from the license in June of 1986. Available leak test records, disposal records and regulatory correspondence for these gauges is contained in Appendix C.

Pu-238 and Fe-55 were authorized for possession under this license in amendments 27 and 33, respectively. The location of use however, was restricted in their respective amendment requests to locations other than the Alcoa Research Laboratory. The location of use for the Pu-238 sealed source was installed in a flouran analyzer located at the Alcoa Technical Center. The Fe-55 was restricted to use as a gauging device at Alcoa in Lebanon, PA.

## 4.0 Instrumentation

Beta-Gamma scanning surveys and total surface contamination measurements were obtained using NE Technology Selectra survey instruments equipped with Model #IDP6 beta plastic scintillation detectors. Floor scans were performed using Ludlum Model 43-37 gas flow proportional detectors and Ludlum Model 2221 counters.

Alpha total surface contamination measurements were obtained using Ludlum Model 43-68 gas flow proportional detectors with Ludlum Model 2221 survey instruments. Floor scans for alpha radioactivity were performed using the Ludlum Model 43-37 gas flow proportional detector and Model 2221 survey instruments.

Removable contamination measurements were made by wiping dry filter papers over a 100 cm<sup>2</sup> area which were then counted using a Ludlum Model 2929 with a Model 43-10-1 alpha/beta detector. Wipes were also counted for H-3 and C-14 using a Packard Tri-Carb liquid scintillation counter. Dose rate measurements were taken with a Bicron microRem meter Model B690G.

The instrumentation used for characterization surveys is summarized in the following tables. Table 4.1 lists the standard features and operating characteristics of each instrument such as probe size and efficiency. Determination of scan rate, count time and the associated MDC values is addressed in Section 4.2.

**Table 4.1 Instrumentation Specifications**

Instrument Model	Detector Model	Detector Type	Detector Area	Window Thickness	Total Efficiency
NE Selectra	NE IDP6DD	Plastic Scintillation	100 cm <sup>2</sup>	0.6 mg/cm <sup>2</sup>	10.4% βγ
Ludlum 2221	Ludlum 43-68	Gas Flow Proportional	126 cm <sup>2</sup>	0.8 mg/cm <sup>2</sup>	20.8% α
Ludlum 2221	Ludlum 43-37	Gas Flow Proportional	540 cm <sup>2</sup>	0.8 mg/cm <sup>2</sup>	17.5% βγ 10.9% α
B690G	Bicron μRem	Plastic Scintillation	N/A	N/A	N/A
Ludlum 2929	Ludlum 43-10-1	Plastic Scintillation	32 cm <sup>2</sup>	0.4 mg/cm <sup>2</sup>	21.4% βγ 34.4% α
Packard Tri-Carb	N/A	Liquid Scintillation	N/A	N/A	50% H-3 90% C-14

#### 4.1. Instrument Calibration and Operability Checks

All instruments were calibrated within the preceding 12 months. Instrument calibration records are presented in Appendix F. Instrument operability checks (e.g., source checks) were performed on a daily basis.

#### 4.2. Counting Times and Minimum Detectable Activity

**Table 4.2 Instrument Operating Parameters and Sensitivities**

Measurement Type	Detector Model	Meter Model	Scan Rate	Count Times		Background (cpm)	MDC (dpm/100cm <sup>2</sup> )
				Bkg.	Sample		
β,γ Surface Scans	Ludlum 43-37	Ludlum 2221	10 in./sec	N/A	N/A	1100	750
β,γ Surface Scans	IDP6DD	NE Selectra	2 in./sec.	N/A	N/A	275	2,100
β,γ Total Surface Activity	IDP6DD	NE Selectra	N/A	600 sec.	60 sec.	275	771
α Total Surface Activity	43-68	Ludlum 2221	N/A	600 sec.	300 sec.	1.6	11
α Surface Scans	Ludlum 43-37	Ludlum 2221	2 in./sec	N/A	N/A	6	28
Photon Exposure Rate	Bicron uRem	N/A	N/A	N/A	N/A	6-10 μR/hr	NA
Removable Beta	Ludlum 43-10-1	Ludlum 2929	N/A	10 min.	60 sec.	50	122
Removable Alpha	Ludlum 43-10-1	Ludlum 2929	N/A	10 min.	60 sec.	0.5	16
Removable Tritium	Tri-Carb	N/A	N/A	10 min.	60 sec.	25	41

##### 4.2.1. Static Counting

Static counting Minimum Detectable Concentration at a 95% confidence level was calculated using the following equation, which is an expansion of NUREG 1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions," Table 3.1 (Strom & Stansbury, 1992):

$$MDC_{static} = \frac{3 + 3.29 \sqrt{B_r \cdot t_s \cdot \left(1 + \frac{t_s}{t_b}\right)}}{t_s \cdot E_{tot} \cdot \frac{A}{100cm^2}}$$

Where:

$MDC_{static}$  = minimum detectable concentration level in dpm/100 cm<sup>2</sup>

$B_r$	= background count rate in counts per minute
$t_b$	= background count time in minutes
$t_s$	= sample count time in minutes
$E_{tot}$	= total detector efficiency for radionuclide emission of interest
$A$	= detector probe area in $cm^2$

A sample calculation for Selectra/IDP6DD MDC:

$$MDC_{static} = \frac{3 + 3.29 \sqrt{500 \cdot 1 \cdot \left(1 + \frac{1}{10}\right)}}{1 \cdot 0.104 \cdot \frac{100cm^2}{100cm^2}} = 771 \text{ dpm}/100cm^2$$

For total alpha activity measurements,  $MDC_{static}$  will be approximately 11 dpm/100  $cm^2$  under the conditions identified above.

#### 4.2.2. Beta- gamma Ratemeter Scanning

The beta-gamma Scanning Minimum Detectable Concentration at a 95% confidence level was calculated using the following equation which is a combination of MARSSIM equations 6-8, 6-9, and 6-10:

$$MDC_{scan} = \frac{d' \sqrt{b_i} \left( \frac{60}{i} \right)}{\sqrt{p} \cdot E_{tot} \cdot \frac{A}{100cm^2}}$$

Where:

$MDC_{scan}$	= minimum detectable concentration level in dpm/100 $cm^2$
$d'$	= desired performance variable (1.38)
$b_i$	= background counts during the residence interval
$i$	= residence interval
$p$	= surveyor efficiency (0.5)
$E_{tot}$	= total detector efficiency for radionuclide emission of interest (includes combination of instrument and surface efficiencies)
$A$	= detector probe area in $cm^2$

Below is a typical MDC calculation for the NE Selectra/IDP-6DD, 6.7cm wide handheld probe operated at a 2 inch/second scan rate:

$$i = 6.7 \text{ cm} \cdot \frac{\text{inch}}{2.54 \text{ cm}} \cdot \frac{\text{sec}}{2 \text{ inch}} = 1.32 \text{ sec}$$

$$b_i = 1.32 \text{ sec} \cdot \frac{275 \text{ counts}}{\text{minute}} \cdot \frac{\text{minute}}{60 \text{ sec}} = 6 \text{ counts}$$

$$MDC_{scan} = \frac{1.38\sqrt{6} \left( \frac{60}{1.32} \right)}{\sqrt{0.5} \cdot 0.104 \cdot \frac{100\text{cm}^2}{100\text{cm}^2}} = 2,089 \text{ dpm}/100\text{cm}^2$$

The beta-gamma scan MDC for the Selectra/IDP-6 is presented as 2,100 dpm/100cm<sup>2</sup> in this report.

Below is a typical MDC calculation for the Ludlum 2221/43-37, 13.3 cm wide floor monitor probe width operated at a 10 inch/second scan rate:

$$i = 13.3 \text{ cm} \cdot \frac{\text{inch}}{2.54 \text{ cm}} \cdot \frac{\text{sec}}{10 \text{ inch}} = 0.52 \text{ sec}$$

$$b_i = 0.52 \text{ sec} \cdot \frac{1,100 \text{ counts}}{\text{minute}} \cdot \frac{\text{minute}}{60 \text{ sec}} = 9.5 \text{ counts}$$

$$MDC_{scan} = \frac{1.38\sqrt{9.5} \left( \frac{60}{.52} \right)}{\sqrt{0.5} \cdot 0.175 \cdot \frac{540\text{cm}^2}{100\text{cm}^2}} = 734 \text{ dpm}/100\text{cm}^2$$

The beta-gamma scan MDC for the 2221/43-37 is presented as 750 dpm/100cm<sup>2</sup> in this report.

#### 4.2.3. Alpha Ratemeter Scanning

Per MARSSIM section 6.7.2.2 it is not practical to determine a fixed MDC for alpha scanning. It is more useful to determine the probability of detecting an area of contamination at a predetermined DCGL for given scan rates. MARSSIM provides the probability of detection of 300 dpm/100 cm<sup>2</sup> of alpha activity while scanning in Table 6.8.

The conditions alpha scans were performed under at Alcoa are bounded by the assumptions of Table 6.8. For example, the scan rate at Alcoa was slower than the value assumed by MARSSIM, the probe dimensions are between the values listed in Table 6.8 and the efficiencies are similar. Consequently the probability of detecting 300 dpm/100 cm<sup>2</sup> approaches 90%. This value is used as the detection limit for alpha scans for the 2221/43-68 handheld instrument gas-flow instrument.

Below is a typical alpha MDC calculation for the Ludlum 2221/43-37, 13.3 cm wide floor monitor probe width at a 1 inch/second scan rate. This value was calculated for informational purposes since the alpha background count rate of the larger floor detector is higher than that of the handheld alpha instrument.

$$i = 13.3 \text{ cm} \cdot \frac{\text{inch}}{2.54 \text{ cm}} \cdot \frac{\text{sec}}{1 \text{ inch}} = 5.2 \text{ sec}$$

$$b_i = 5.2 \text{ sec} \cdot \frac{6 \text{ counts}}{\text{minute}} \cdot \frac{\text{minute}}{60 \text{ sec}} = 0.52 \text{ counts}$$

$$MDC_{scan} = \frac{1.38\sqrt{.52} \left( \frac{60}{5.2} \right)}{\sqrt{0.5} \cdot 0.109 \cdot \frac{540 \text{ cm}^2}{100 \text{ cm}^2}} = 28 \text{ dpm}/100 \text{ cm}^2$$

The alpha scan MDC for the 2221/43-37 is presented as 30 dpm/100cm<sup>2</sup> in this report.

#### 4.2.4. Smear Counting

Smear counting Minimum Detectable Concentration at a 95% confidence level was calculated using the following equation, which is an expansion of NUREG 1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions", Table 3.1 (Strom & Stansbury, 1992):

$$MDC_{smear} = \frac{3 + 3.29 \sqrt{B_r \cdot t_s \cdot \left(1 + \frac{t_s}{t_b}\right)}}{t_s \cdot E}$$

Where:

- $MDC_{smear}$  = minimum detectable concentration level in dpm/smear
- $B_r$  = background count rate in counts per minute
- $t_b$  = background count time in minutes
- $t_s$  = sample count time in minutes
- $E$  = instrument efficiency for radionuclide emission of interest

Typical calculation for Ludlum 43-10-1 (beta):

$$MDC_{smear} = \frac{3 + 3.29 \sqrt{45 \cdot 1.0 \cdot \left(1 + \frac{1.0}{10}\right)}}{1.0 \cdot 0.214} = 122 \text{dpm} / 100 \text{cm}^2$$

Calculations are similar for alpha and for tritium/carbon-14.

### 4.3. Uncertainty

The counting uncertainty for each contamination measurement is calculated using equation 6-15 from MARSSIM:

$$\sigma = 1.96 \sqrt{\frac{C_{s+b}}{T_{s+b}^2} + \frac{C_b}{T_b^2}}$$

Where:

$\Sigma$	=	Uncertainty
1.96	=	Multiplier to achieve 95% confidence level
$C_{s+b}$	=	gross counts of the sample (cpm)
$T_{s+b}$	=	Sample time (minutes)
$C_b$	=	Gross background counts (cpm)
$T_b$	=	Background count time (minutes)

## **5.0 Design and Performance of Simplified Final Status Survey**

Simplified Final Status Surveys were performed to identify any residual radioactivity at the Alcoa Research Laboratory facilities in which licensed radioactive material may have been stored. Based on a review of operations at the facility, these areas are limited to the radiological laboratories located on the Building 44 mezzanine.

### **5.1. Total Activity**

These areas were surveyed using the following survey protocol. Floors, lower walls and installed equipment (e.g., case work) were 100% scan surveyed for beta gamma radioactivity at the scan speeds and detection sensitivities listed in Section 4.0. Twenty percent of walls above 2 meters and ceilings were surveyed for beta gamma radioactivity. Twenty percent of the area of floors and walls up to 2 meters were scanned for alpha radioactivity.

Static measurements were made at each area exhibiting elevated radiation levels, or at a frequency of one measurement per 100 ft<sup>2</sup> of floor and wall area up to 2 m. Samples were collected from areas exhibiting elevated levels of activity.

### **5.2. Removable Activity**

Removable contamination measurements were performed by wiping smears or swabs over approximately 100 cm<sup>2</sup> of the surface measured using moderate hand pressure. Smears were taken at each area exhibiting elevated radiation levels, or at a frequency of one measurement per 100 ft<sup>2</sup> of floor and wall area up to 2 m and collocated with static measurements.

### **5.3. Dose Rate Surveys**

Dose rate surveys were performed by walking through each of the mezzanine labs and areas with a Bicon Model B690G microRem meter held at a one-meter height. Readings were recorded at a rate of 1 per square meter of floor surface area.

## 6.0 Results

All laboratories and offices located in the Building 44 mezzanine were surveyed as described in Section 5.0, above.

Direct radiation levels were 5-8  $\mu\text{R}/\text{hour}$ , including background, in all locations with the exception of areas immediately adjacent to the exterior wall, stairwell, and east wall of rooms 600 (High Level Chem Lab), 604 (Isotope Storage Room), and 605 (North Lab). These walls are constructed with a buff colored brick that uniformly increased nearby ambient background by 2-3  $\mu\text{R}/\text{hour}$ . In locations where the buff colored brick was present on multiple sides (e.g., in corners and in the source storage cavity) the total dose rate ranged up to approximately 12  $\mu\text{R}/\text{hr}$ . These measurements are consistent with the presence of a minor amount of naturally occurring radioactive material present in the building material. The effect is uniform throughout the laboratories and stairwell. Appendix E, Figure E.4 is a photograph of the brick used in the exterior wall and source storage cavity. A posting plot of direct radiation levels is presented in Appendix H, Figure H.8.

Removable beta-gamma, alpha, or tritium activity was not identified above detection limits.

Total alpha activity measurements throughout the facility were less than the MDA of 22  $\text{dpm}/100 \text{ cm}^2$  with the exception of measurements taken on directly on unpainted surfaces of buff colored structural bricks. Total alpha activity measurements made on the on unpainted buff colored brick ranged up to 43  $\text{dpm}/100 \text{ cm}^2$ . As noted above, this is consistent with the presence of minor levels of naturally occurring radioactive materials within the brick matrix.

Several small areas ( $<0.5 \text{ ft}^2$  each) of elevated fixed beta-gamma activity were noted on the floor of the isotope storage room. The highest spot measured was approximately 300,000  $\text{dpm}/100\text{cm}^2$ . Other spots ranged from approximately 12,000  $\text{dpm}/100 \text{ cm}^2$  up to 120,000  $\text{dpm}/100 \text{ cm}^2$ . Two small spots of activity were noted on the corridor floor outside the storage room. Activities measured in these locations were 7,300 and 18,700  $\text{dpm}/100 \text{ cm}^2$ . One small spot was identified on a baseboard located in the high level chemistry lab. The measured activity in this location was approximately 15,100  $\text{dpm}/100 \text{ cm}^2$ .

Samples were collected from the highest activity locations for isotopic identification by gamma spectral analysis. Due to the small size and shallow depth of the contamination, total activity levels were reduced significantly when the samples were collected. Following sampling, measured activity levels ranged from 1,200  $\text{dpm}/100 \text{ cm}^2$  to 15,100  $\text{dpm}/100 \text{ cm}^2$ . Pre and post sampling activities for each area are listed in Table 6.1

Table 6.1 Elevated Activity Measurements

Area	Location	Initial Activity (dpm/100 cm <sup>2</sup> )	Area (cm <sup>2</sup> )	Post Sample Activity (dpm/100 cm <sup>2</sup> )
Source Storage	Floor 1	70,400	100	4,480
	Floor 2	49,300	100	3,490
	Floor 3	122,400	200	4,300
	Floor 4	295,400	100	6,900
	Floor 5	22,400	100	3,800
Corridor	Floor 1	7,300	100	6,400
	Floor 2	25,200	100	1,800
High Level Lab	Baseboard	15,100	100	15,100

Due to the small amounts of activity present, material from these locations was composited into a total of four samples. Summary results of gamma spectral analysis are presented in Table 6.2 below. Complete analytical data sheets are presented in Appendix G to this report.

Table 6.2 Sample Isotopic Activity and Mass

Isotope	Sample 1 (pCi/g)	Sample 2 (pCi/g)	Sample 3 (pCi/g)	Sample 4 (pCi/g)
K-40	3.84 ± 4.41E-1	3.93 ± 5.61E-1	<1.26E1	<4.09
Co-60	6.3E-2 ± 2.05E-2	<4.26E-2	<9.6E-1	<8.91E-1
Cs-137	2.86 ± 5.87E-2	1.22 ± 5.36E-2	2.88E3 ± 2.21E1	6.12E3 ± 3.06E1
Ra-226	<5.02E-1	1.34±5.82E-1	<5.05E1	<7.19E1
Ac-228	4.19E-1 ± 9.11E-2	4.95E-1±1.42E-1	<2.39	<3.23
Th-228	2.21 ± 3.66E-1	<7.22E-1	<4.86E1	<6.85E1
Th-232	4.42E-1 ± 6.77E-2	5.62E-1±9.42E-2	<2.38	<3.21
Sample Mass	62.4 g	73.3 g	12.7 g	16.2 g

Laboratory analysis of the samples indicated the elevated beta activity was due to the presence of Cs-137. As noted in Section 3.0 the default screening value for Cs-137 is 2.8E4 dpm/100 cm<sup>2</sup>. All areas were re-surveyed and found to be less than the DSV after samples were collected for nuclide identification.

Cs-137 was the only isotope identified in any significant quantity in the samples collected from Building 44. Based on a maximum measurement of 15,100 dpm/100cm<sup>2</sup> the highest measured total contamination value is 53% of the Cs-137 default screening value. Since the area of the measured contamination is approximately 100 cm<sup>2</sup>, the expected annual dose is much less than 25 mrem/y. A simplified RESRAD Build run provided as Appendix J estimates the annual exposure as <0.003 mRem/y to a receptor located in the room at a distance and height of 1 m.

## **7.0 Quality Assurance**

The Final Status Survey was performed in accordance with the requirements of Philotechnics Quality Assurance Manual, QAM001 and QA Procedures QAP002.

Instrumentation was calibrated by a licensed calibration facility within the preceding 12 months. Source and operability checks were performed on a daily basis.

Radiation and contamination surveys were performed in accordance with Philotechnics' Health Physics Operating Procedures.

Final status surveys were performed by technicians under the supervision of an ANSI 18.1 qualified supervisor and under the direction of a Certified Health Physicist. Data was reviewed by a Certified Health Physicist.

**Appendix A**

**Correspondence Regarding Deletion and Addition  
of ARL to License 37-0653-02**

0749

ALUMINUM COMPANY OF AMERICA

15668



ALUMINUM

March 8, 1971

U. S. Atomic Energy Commission

Washington, D. C. 20545

Attn: Mr. Robert Brinkman  
Isotope Branch  
Division of Licensing and Regulations

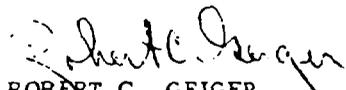
Dear Sir:

The Aluminum Company of America is presently building new laboratory facilities, and the proposed plan is to transfer personnel and equipment into the new buildings as they are completed.

The next phase of moving will include the radioactive tracer laboratories, authorized under AEC license no. 37-07653-02.

We wish to be advised on proper procedures and methods for clearing of present area and preparations for licensing of the new location.

Very truly yours,

  
ROBERT C. GEIGER  
Radiation Safety Officer

RCG:ES

MAR 23 1971

DML:MB:KEB  
(0749)

Aluminum Company of America  
Alcoa Research Laboratories  
ATTN: Mr. Robert C. Geiger  
Radiation Safety Officer  
P. O. Box 772  
New Kensington, Pennsylvania 15068

Gentlemen:

Prior to transferring your radioisotope program to your new laboratory building, you should provide us with a description of facilities and equipment of the new laboratory relative to the safe handling of radioactive materials. With respect to your old laboratory, we are enclosing a copy of guidelines currently used in connection with decontamination of facilities and equipment prior to release for unrestricted use.

Sincerely,

Original signed by  
Robert E. Brinkman

Robert E. Brinkman  
Materials Branch  
Division of Materials  
Licensing

Enclosure:  
Guidelines For Decontamination  
of Facilities And Equipment  
Prior To Release For Unrestricted  
Use

bcc: St. Br. Dist.  
CO, REGION I  
DML R/F

OFFICE ▶	DML:MB				
SURNAME ▶	REBrinkman:clh				
DATE ▶	3/22/71				

ALUMINUM COMPANY OF AMERICA

P. O. BOX 772 - NEW KENSINGTON, PA.

ALCOA RESEARCH LABORATORIES



ALCOA

April 28, 1971

Mr. Robert E. Brinkman  
Materials Branch  
Division of Materials Licensing  
USAEC  
Washington D.C. 20545

Dear Mr. Brinkman:

Re: License No. 37-7653-2  
Your Letter of March 23, 1971

As you advised, I am writing this letter to amend our license to include the radiochemical laboratory at Alcoa Research Laboratories' new location. I am doing this in the stead of R. C. Geiger, our Radio Safety Officer, since he is hospitalized with a stomach ulcer and there is some urgency in amending our license.

The new location is at the:

Mail Address: Alcoa Technical Center  
P. O. Box 2970  
Pittsburgh, Pa. 15230

Location: Seventh Street Road, Route 780  
Merwin, Pa.  
Westmoreland County

The radiochemical laboratories are located on the third floor of Building C at the Technical Center. Figure 1 is a copy of the west end of the third floor showing the Physical Chemistry Division. The area devoted to the radiochemical laboratory is outlined in red. Figure 2 is a detailed layout showing location of isotope storage, hot laboratory, a darkroom for autoradiographic work, and counting room. Most of the equipment and supplies in the present laboratory are being moved to the new location to continue present programs in radiochemistry.

**COPIES**  
COMPLIANCE

Mr. Robert E. Brinkman  
April 28, 1971  
Page 2

The attached tables are current lists of (I) radiation detection instruments and (II) equipment and facilities. According to AEC guidelines, R. C. Geiger will see to closing of the old facilities when he returns to work.

Please let us know when it will be permissible to move radioactive materials to the new location.

Sincerely yours,



R. A. Kramer  
Senior Research Scientist  
Analytical Chemistry Division

RAK:amm

Attachments

cc: R. C. Geiger - ARL, New Kensington  
C. N. Cochran - ARL, New Kensington  
T. B. Bonney - Pittsburgh Office

TABLE I. Radiation Detection Instruments

<u>Kind of Instrument</u>	<u>Make &amp; Serial No.</u>	<u>Range</u>	<u>Use</u>
Nuclear Chicago Single Channel Analyzer/Scaler	Model 8725, Ser. No. 599		Measurement
Nuclear Chicago Decade Scaler	Model 8703, Ser. No. 413		Measurement
Nuclear Chicago Automatic Sample Changer and Flow Counter	Model 1042, Ser. No. ASD 3028		Measurement
Nuclear Chicago Survey Meter	Model 2652, Ser. No. 1842	0-100 mr	Health Monitoring
RIDL 400 Channel Pulse Height Analyzer	Model 34-12, Ser. No. 106115B		Measurement
Nuclear Chicago Single Channel Rate Meter	Model 8733, Ser. No. 129		Measurement & Health Monitoring
Nuclear Chicago Survey Meter	Model 2612-P, Ser. No. 2723	0-20 mr	Health Monitoring
Dosimeter Pens	Keleket X16432 K01209 X16385 K00247 K112 K00665 K01957	0-200 mr	Health Monitoring
Survey Meter	Jordan Model	0.05 mr - 50R	Health Monitoring
Alpha Survey Meter	Nuclear Instr. & Chem. Corp. Model 2112-P	0-1500 cpm	Health Monitoring
Vibrating Reed Electrometer	Applied Physics Model 31		Measurement
Lead Shields - 3	Technical Assoc. Model LS-6, Serial Nos. 613, 952 and 1092		Measurement
Scintillation Counters - 2	Laboratory assembled		Measurement
Scaler	Nuclear-Chicago Model 192A		Measurement
Flow Counter	Nuclear-Chicago Model D-47		Measurement

22050

TABLE II. Facilities and Equipment

32	2 x 6 x 8 Bricks (Steel, Painted)
1	Tracer Lab Model E-12 Storage Container
1	Tracer Lab Model E-12B Isotope Lead Container
1	Brick-lined Storage Chest (7' x 1-1/2')
3	Sample Cabinets
1	Vacuum Cleaner
1	Glove Box
2	Kewance "Isotope Hoods", Stainless Steel Construction, Interior Walls to be Coated With Strippable Lacquer.
2	Leaded Glass Shields, 12" x 12" x 1"
6	Plate Glass Shields, 12" x 12" x 3/4"
2	Plate Glass Shields, 12" x 24" x 3/4"

ALUMINUM COMPANY OF AMERICA

P. O. BOX 772 - NEW KENSINGTON, PA.

ALCOA RESEARCH LABORATORIES



ALCOA

June 18, 1971

U. S. Atomic Energy Commission

Washington, D. C. 20545

Attn: Director  
Division of Material Licensing

Dear Sir:

The Aluminum Company of America has recently completed another unit of their new Research and Development Center and the radiochemical tracer group will be relocated in the new building.

Prior to the release from regulatory controls for unrestricted use of the area used by this group at these laboratories, a radiation survey was made and a copy of the results is attached. Listed below is a description of the general procedures followed in our survey.

1. The amount of removable radioactive material per 100 cm<sup>2</sup> of surface area was determined by wiping the area with dry filter paper and assessing the amount of radioactive material on the wipe.
2. The interior surfaces of all exhaust duct work were wipe tested.
3. Survey of drain lines was determined by making wipe test measurements of the interior surfaces at all traps.
4. Strippable paint coating on interior surfaces of hoods was removed, hoods washed and wipe tested.
5. Equipment and furniture were washed and surveyed for contamination.
6. Complete area was monitored with a Nuclear-Chicago Model 2650 thin window geiger tube survey meter and all areas show less than 0.2 mrad/hr. at 1 cm.
7. All waste material was disposed of at facilities of Nuclear Engineering Company, Morehead, Kentucky.

**COPIES**  
SENT TO COMPLIANCE

U.S. Atomic Energy Commission  
June 18, 1971  
Page 2

1813

Subject to your review of the aforementioned information we request that condition 10 of By-product Material License No. 37-07653-02 be amended to delete the following location where licensed material may be used:

Aluminum Company of America  
Alcoa Research Laboratories  
P. O. Box 772, Freeport Road  
New Kensington, Pennsylvania 15068

Licensed material will only be used at the following location as noted in condition 10:

Aluminum Company of America  
Alcoa Technical Center  
Seventh Street Road, Route 780  
Merwin, Pennsylvania

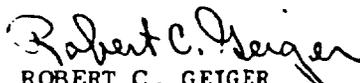
A copy of this letter is being forwarded to the Director of the Regional Division of Compliance office for this region, as indicated.

Please forward all future correspondence to the undersigned at the mailing address of the new location:

Aluminum Company of America  
Alcoa Technical Center  
P. O. Box 2970  
Pittsburgh, Pennsylvania 15230

If additional information is needed, feel free to call on me at your convenience.

Very truly yours,

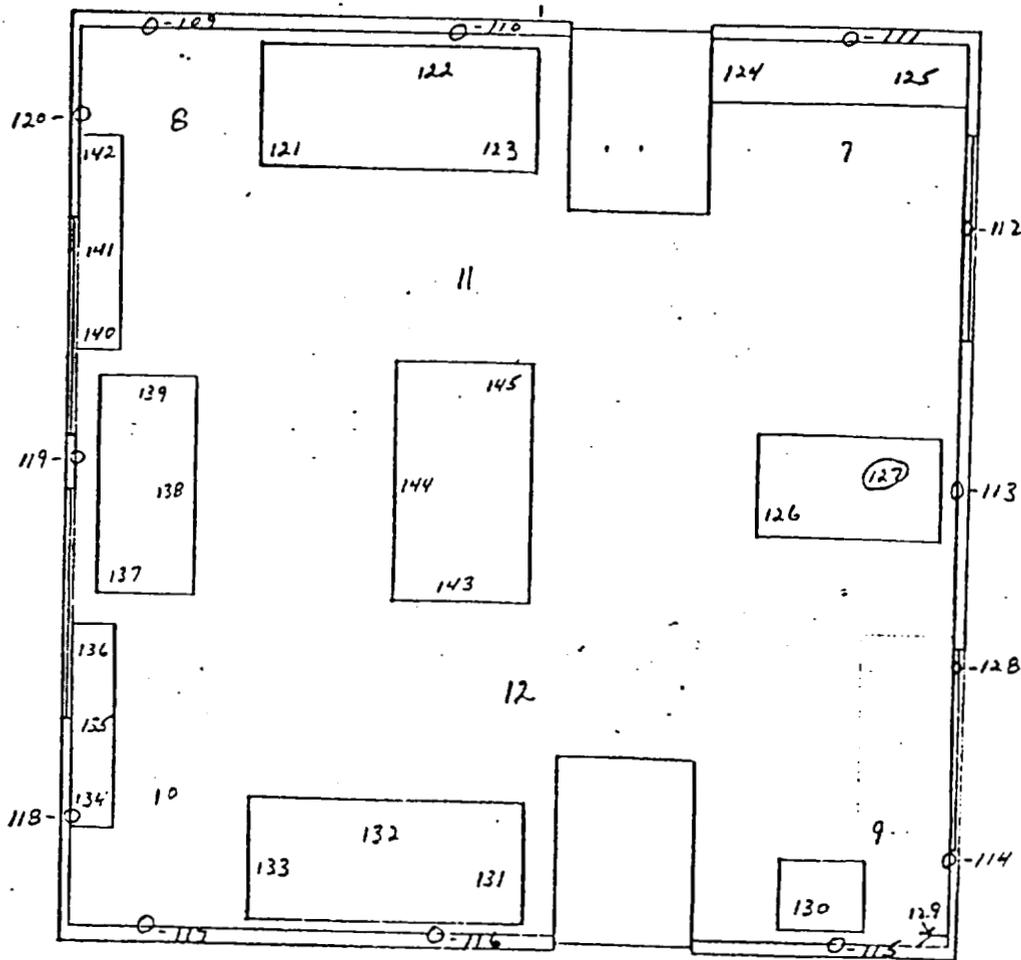
  
ROBERT C. GEIGER  
Radiation Safety Officer

RCG:ES  
Attachment: 1

cc: Director, Div. of Compliance, USAEC  
970 Broad St., Newark, N.J. 07102

21385

ELECTRONICS LAB.



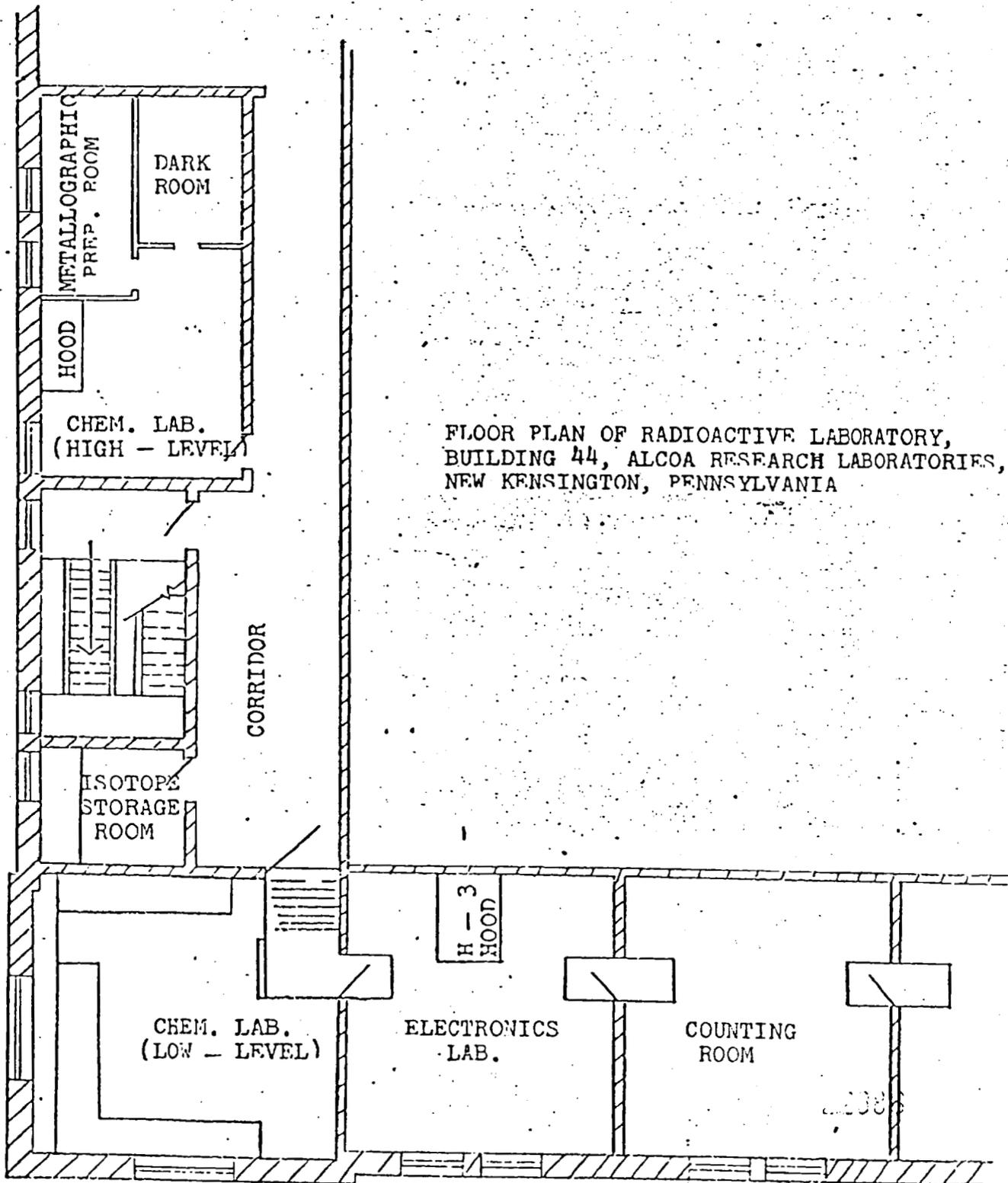
LOCATION: Electronics Lab.

Date Taken: 4/29/71  
 Date Counted: 5/14/71

Data Sheet No: 2700, 2710  
 Counter Used: Nuclear Chicago A.S.C.(G.M.)

Patch No.	Description	CPM	d/Min.	$\mu c(10^{-6})$
109	Top of electrical conduit	0	0	0
110	" " " "	0.6	2.5	1.1
111	" " " "	1.3	5.5	2.5
112	Window sill	0	0	0
113	Top of electrical conduit	0	0	0
114	" " " "	0.8	3.4	1.5
115	" " " "	0	0	0
116	" " " "	1.2	4.9	2.2
117	" " " "	0	0	0
118	" " " "	0	0	0
119	" " " "	0	0	0
120	" " " "	1.3	5.3	2.4
121	Table top	0	0	0
122	" "	1.0	4.1	1.8
123	" "	0	0	0
124	Work bench top	3.4	13.9	6.3
125	" " "	1.6	6.5	2.9
126	Base for hood	2.1	8.6	3.9
127	Top of hood	0.6	2.4	1.1
128	Window sill	3.5	14.3	6.4
129	Small ledge	0.5	2.0	0.9
130	Sink	0	0	0
131	Work bench top	0	0	0
132	" " "	1.0	4.1	1.8
133	" " "	3.4	13.9	6.3
134	Top of wall cabinet	1.8	7.3	3.3
135	" " " "	1.7	6.9	3.1





FLOOR PLAN OF RADIOACTIVE LABORATORY,  
BUILDING 44, ALCOA RESEARCH LABORATORIES,  
NEW KENSINGTON, PENNSYLVANIA



LOCATION: Chemistry Lab. (High - Level)

Date Taken: 4/29/71

Data Sheet No: 2704, 2705, 2706, 2707

1813

Date Counted: 5/12/71, 5/13/71, 5/14/71

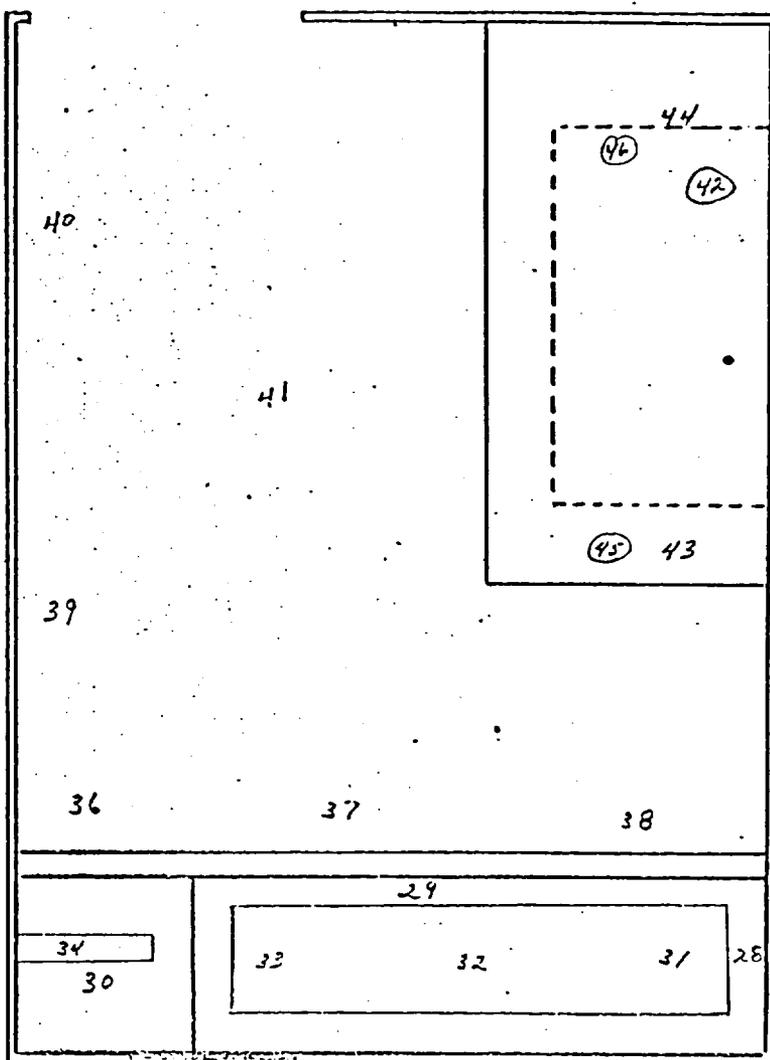
Counter Used: Nuclear Chicago A.S.C. (G.M.)

Patch No.	Description	CPM	d/Min.	$\mu c(10^{-6})$
17	Top of air-conditioner	2.6	10.8	4.9
18	Sink	0	0	0
19	Hood, work surface	1.8	7.5	3.4
20	" , " "	2.2	9.2	4.1
21	" , " "	1.1	4.6	2.1
22	" , " "	2.3	9.6	4.3
23	" , " "	3.4	14.2	6.4
24	" , Wall	2.2	9.2	4.1
25	" , "	0	0	0
26	" , "	2.0	8.3	3.7
27	" , "	2.5	10.4	4.7
28	Table top	2.4	10.0	4.5
29	" "	2.9	12.1	5.5
30	" "	2.9	12.1	5.5
31	Microscope table	0	0	0
32	" "	2.0	8.3	3.7
33	Top of cabinet	1.3	5.4	2.4
34	" " "	1.8	7.5	3.4
35	Ledge	1.3	5.4	2.4
36	Bench top	0	0	0
37	" "	4.2	17.5	7.9
38	" "	2.8	11.7	5.3
39	" "	2.2	9.2	4.1
40	" "	1.1	4.6	2.1



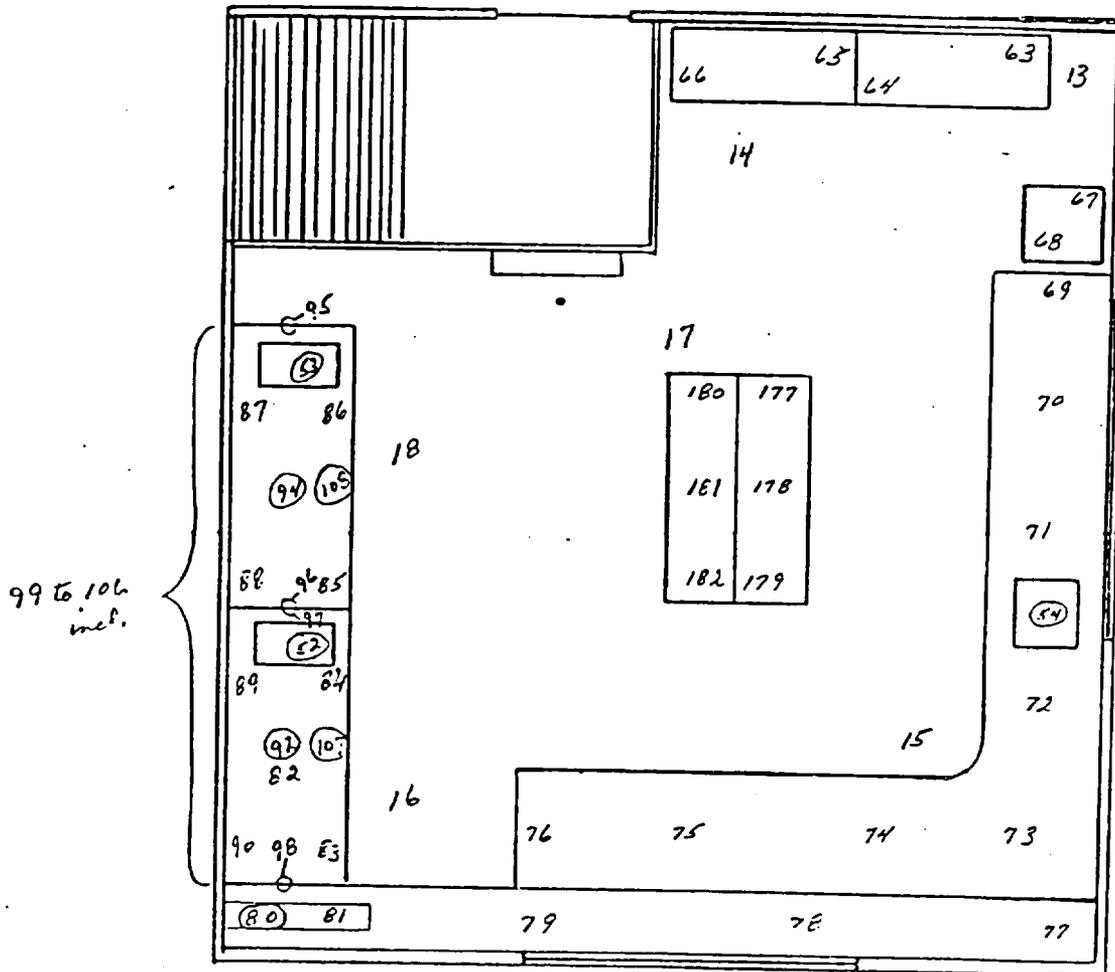


ISOTOPE STORAGE ROOM





CHEMISTRY LAB. (LOW - LEVEL)



LOCATION: Chemistry Lab. (Low - Level)

1813

Date Taken: 4/29/71

Data Sheet No: 2700, 2707, 2708

Date Counted: 5/13/71, 5/14/71

Counter Used: Nuclear Chicago A.S.C. (G.M.)

Patch No.	Description	CPM	d/Min.	$\mu c(10^{-6})$
63	Top of glassware cabinet	1.9	7.8	3.5
64	" " " "	1.2	4.9	2.2
65	" " " "	1.0	4.1	1.8
66	" " " "	0.2	0.8	0.4
67	Balance table	0	0	0
68	" "	0	0	0
69	Top of work bench	0	0	0
70	" " " "	0	0	0
71	" " " "	0	0	0
72	" " " "	0	0	0
73	" " " "	0	0	0
74	" " " "	0	0	0
75	" " " "	0	0	0
76	" " " "	0	0	0
77	Wall ledge	1.2	4.9	2.2
78	" "	1.3	5.3	2.4
79	" "	0	0	0
80	" "	2.4	9.8	4.4
81	Beam	2.5	10.2	4.6
82	Working surface of hood	1.1	4.5	2.0
83	" " " "	0.6	2.4	1.1
84	" " " "	0	0	0
85	" " " "	0	0	0
86	" " " "	0	0	0
87	" " " "	1.5	6.3	2.8
88	" " " "	0	0	0
89	" " " "	0	0	0

LOCATION: Chemistry Lab. (Low - Level) (Cont'd.)

Date Taken: 4/29/71

Data Sheet No: 2700, 2109, 2712, 2713

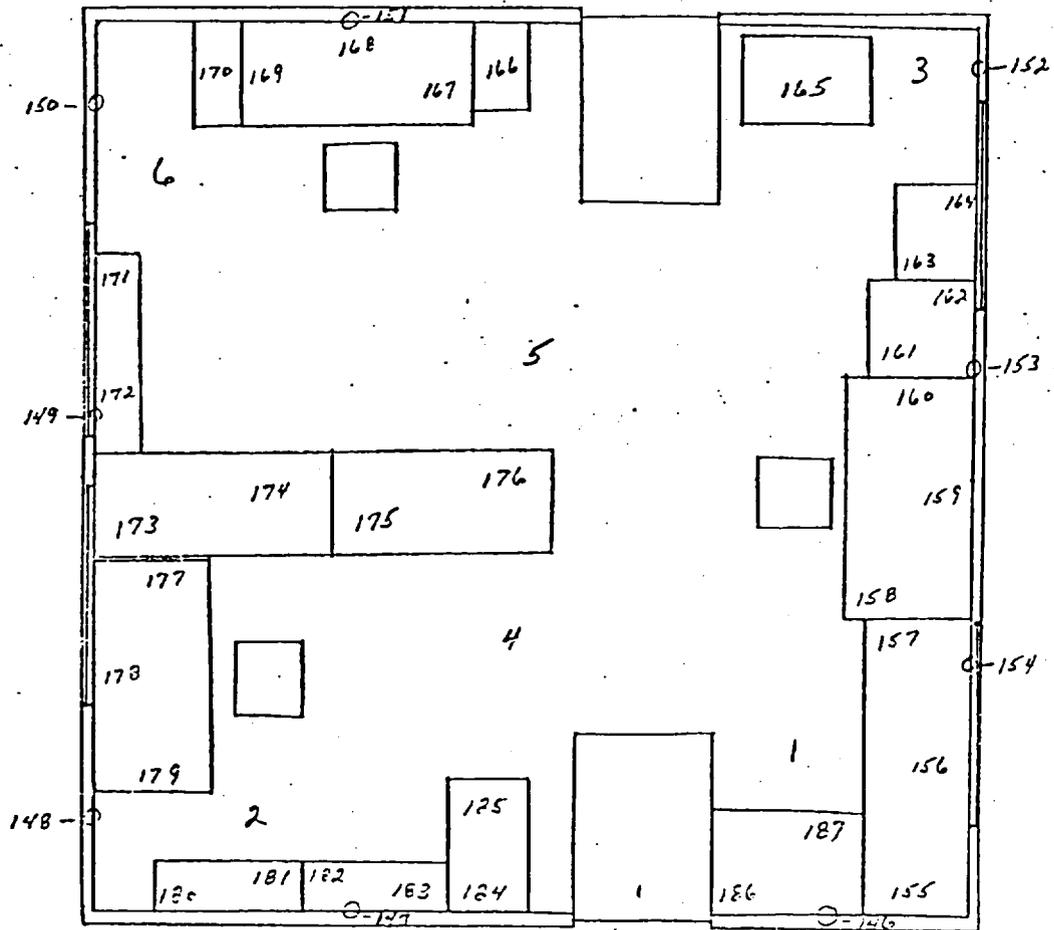
Date Counted: 5/14/71, 5/17/71

Counter Used: Nuclear Chicago A.S.C. (G.M.)

Patch No.	Description	CPM	d/Min.	$\mu c(10^{-6})$
90	Hood - Work surface	0	0	0
91	" Back surface of rear baffle	0.8	3.4	1.5
92	" Internal surface of flue duct	0	0	0
93	" Back surface of rear baffle	0	0	0
94	" Internal surface of flue duct	0	0	0
95	" Side wall	0	0	0
96	" " "	1.0	4.2	1.9
97	" " "	0	0	0
98	" " "	0	0	0
99	" Rear wall, behind baffle	0.6	2.5	1.1
100	" Back side of top baffle	0.2	0.8	0.4
101	" Rear wall, behind baffle	0	0	0
102	" Back side of top baffle	0.7	3.0	1.4
103	" Front side of back baffle	0.2	0.8	0.4
104	" " " " " "	1.7	7.2	3.2
105	" Front side of top baffle	0	0	0
106	" " " " " "	0.2	0.8	0.4
107	" Top, outside	1.5	6.3	2.8
108	" " "	0	0	0
177	Table top	0.6	2.5	1.1
178	" "	1.1	4.6	2.1
179	" "	0	0	0
180	" "	2.0	8.4	3.8
181	" "	0	0	0
182	" "	1.6	6.7	3.0



# COUNTING ROOM



LOCATION: Counting Room

Date Taken: 4/29/71

Data Sheet No: 2711, 2712

Date Counted: 5/14/71, 5/17/71

Counter Used: Nuclear Chicago A.S.C. (G.M.)

Batch No.	Description	CPM	d/Min.	$\mu c(10^{-6})$
146	Top of electrical conduit	0	0	0
147	" " " "	2.7	11.0	5.0
148	" " " "	0.4	1.6	0.7
149	" " " "	0.9	3.7	1.7
150	" " " "	0.6	2.4	1.1
151	" " " "	3.4	13.9	6.3
152	" " " "	0	0	0
153	" " " "	0.6	2.4	1.1
154	" " " "	0.9	3.7	1.7
155	Table top	1.1	4.5	2.0
156	" "	3.5	14.3	6.4
157	" "	3.7	15.1	6.8
158	Desk top	0	0	0
159	" "	0.1	0.4	0.2
160	" "	0	0	0
161	Base cabinet top	0	0	0
162	" " "	0	0	0
163	" " "	1.1	4.6	2.1
164	" " "	0	0	0
165	Top of air conditioner	0.8	3.4	1.5
166	Top of filing cabinet	0.3	1.3	0.6
167	Desk top	1.6	6.7	3.0
168	" "	0	0	0
169	" "	0	0	0
170	Top of filing cabinet	0.8	3.4	1.5
171	Top of bookcase	0	0	0
172	" " "	3.0	12.6	5.7

LOCATION: Counting Room (Cont'd.)

1813

Date Taken: 4/29/71  
Date Counted: 5/17/71

Data Sheet No: 2712, 2713  
Counter Used: Nuclear Chicago A.S.C.(G.M.)

Patch No.	Description	CPM	d/Min.	$\mu c(10^{-6})$
173	Table top	1.5	6.3	2.8
174	" "	0.	0	0
175	" "	0.2	0.8	0.4
176	" "	2.8	11.8	5.3
177	Desk top	0.6	2.5	1.1
178	" "	1.1	4.6	2.1
179	" "	0.0	0	0
180	Top of bookcase	2.0	8.4	3.8
181	" " "	0	0	0
182	" " "	1.6	6.7	3.0
183	" " "	0	0	0
184	Table top	0	0	0
185	" "	0.4	1.7	0.8
186	" "	0	0	0
187	" "	0	0	0
Patch samples listed below taken 5/25/71 and counted 5/27/71 Counts recorded on Data Sheet No. 2714.				
1	Floor	1.2	5.0	2.3
2	"	0	0	0
3	"	1.3	5.5	2.5
4	"	0	0	0
5	"	1.5	6.3	2.8
6	"	0.3	1.3	0.6

Aluminum Company of America  
Alcoa Technical Center  
P. O. Box 2970  
Pittsburgh, Pennsylvania  
15230

In accordance with letter dated June 18, 1971, License Number 37-07653-02 is amended as follows:

Items 1 and 2 are amended to read:

- 1. Aluminum Company of America
- 2. Alcoa Technical Center  
P. O. Box 2970  
Pittsburgh, Pennsylvania 15230

Condition 10 is amended to read:

10. Licensed material may only be used at Seventh Street Road, Route 780, Merwin, Pennsylvania, except sealed sources in gauges and analytical devices may also be used at Aluminum Company of America facilities throughout non-Agreement States.

Date JUL 15 1971

For the U. S. Atomic Energy Commission  
Original Signed by  
Robert E. Brinkman  
Materials Branch

by \_\_\_\_\_  
Division of Materials Licensing  
Washington, D. C. 20545

*PLM* *REB/bm*

ALUMINUM COMPANY OF AMERICA

ALCOA TECHNICAL CENTER

ALCOA CENTER, PA 15069

(- 2) 339-4651



1978 July 21

Radioisotope Licensing Branch  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

ATTN: George Kligfield

Dear Mr. Kligfield:

Reference is made to our phone conversation of 1978 July 19 in which you requested additional information to support my request for renewal of Byproduct Material License No. 37-07653-02, letter dated 1978 Feb 27. Reference should also be made to control no. 93339.

Attached is a revised version of Attachment B which will supersede previous page sent in original amendment request. This list includes all sealed sources either in use or in storage at the two locations listed.

I hope the above information will be sufficient to complete the review of the requested license amendment.

Sincerely,

Robert C. Geiger  
Radiation Safety Officer

/ds

Attachment

COPIES SENT TO OFF. OF  
INSPECTION AND ENFORCEMENT

ATTACHMENT B

6a - Byproduct Material

6b - Chemical and/or Physical Form  
Maximum number of millicuries

- |  |  |
|--|--|
| A) Any byproduct material between atomic nos. 1 and 83 | any - not to exceed 2 curies per radionuclide, except Hydrogen <sup>3</sup> - 20 curies<br>Strontium 90 - 50 millicuries |
| B) Cesium-137  | 2x500 millicuries - sealed source (Texas Nuclear Model 570-57157C)   |
| C) Cesium-137  | 2x20 millicuries - sealed source (Texas Nuclear Model 570-57157C)  |
| ✓ D) Cesium-137  | 2x100 millicuries - sealed source (Model NER-570)  |
| ✓ E) Nickel-63   | three (3) sources not to exceed 15 millicuries each (plated source in Hewlett-Packard Model 18713-60520 detector cell)   |
| ✓ F) Hydrogen-3  | two (2) sources not to exceed 1000 millicuries each (plated source in Analog Technology Corp. Model 140 detector cell)   |
| /G) Hydrogen-3   | 200 millicuries - sealed source (U.S. Radium Foil Model LAB 508-3)   |
| H) Krypton-85  | 3x500 millicuries - sealed source (tracerlab S-76A)  |
| I) Cobalt-60   | 100 millicuries - sealed source (Instrument Inc., Model B-20-14)   |
| J) Radium-226  | 3.3 millicuries - sealed source (Troxler drawing No. A-100280 Rev. B)  |
| K) Cesium-137/Americium-241                            | 3x10 millicuries Ca-137/50 millicuries Am241 (Troxler drawing No. A-100280)  |
| L) Cesium-137  | 2000 millicuries - sealed sources (Amersham-Searle Model 850233, 3M Type 4P6M or 4P6E)                                   |
| M) Strontium-90  | 300 millicuries - sealed source (U.S. Radium Model LAB 370-1)  |
| N) Cesium-137  | 100 millicuries - sealed source (Ohmart Corp. Model A-2102)  |
| O) Cesium-137  | 300 millicuries - sealed source (Ohmart Corp. Model A-2102)  |

- A) Research and Development as defined in 10CFR30.
- B) Each source to be used in a Texas Nuclear Model 5191 source holder for density measurements.
- C) Each source to be used in a Texas Nuclear Model 5192 source holder for level measurements.
- D) Each source to be used in a Kay Ray Model 7062P source holder for level measurements.
- E) For use in a Hewlett-Packard Model 5830A gas chromatograph for sample analysis.
- F) For use in a Carle Model 111H gas chromatograph for sample analysis.
- G) For use in an Analytical Instrument Development, Inc. Model 510-6007 electron capture detector used in an AID Model 511 gas chromatograph.
- H) For use in a Tracerlab Model HUB-76A source holder for thickness measurements.
- I) For use in an Instrument, Inc. Model B-20-06 source holder to detect levels.
- J and K) For use in a Troxler Electronic Laboratory Model 2401 soil testing gauge.
- L) For use in a Nuclear Chicago Model 5120 gauge for density measurements.
- M) For use in a Ohmart Model LBG-2 source holder for thickness measurements.
- N) For use in a Ohmart Model ED-6 source holder for density measurements.
- O) For use in a Ohmart Model HM-8 source holder for density measurements.

(Items B through O) To be used in gauges and analytical devices for process control and sample analysis at the Aluminum Company of America facilities located at the following address:

Alcoa Technical Center  
Alcoa Center, PA 15069

and

Alcoa Research Laboratory  
New Kensington, PA 15068

**U. S. NUCLEAR REGULATORY COMMISSION  
MATERIALS LICENSE**

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		
1. Aluminum Company of America Alcoa Technical Center  2. P. O. Box 2970 Alcoa Center, Pennsylvania 15069		In accordance with application dated February 24, 1978  3. License number 37-07653-02 is amended in its entirety to read as follows:  4. Expiration date October 31, 1983  5. Docket or Reference No.
6. Byproduct, source, and/or special nuclear material  A. Any byproduct material between Atomic Nos. 1 and 83, inclusive B. Hydrogen 3 C. Cesium 137  D. Cesium 137  E. Cesium 137  F. Nickel 63  G. Hydrogen 3	7. Chemical and/or physical form  A. Any  B. Any C. Texas Nuclear Model 570-57157C Sealed Sources D. Texas Nuclear Model 570-57157C Sealed Sources E. New England Nuclear Model NER570 Sealed Sources F. Plated sources in Hewlett-Packard Model 18713-60520 detector cells G. Plated sources in Analog Technology Corp. Model 140 detector cells	8. Maximum amount that licensee may possess at any one time under this license  A. Two curies of any isotope not to exceed 5 curies total radio-activity B. 20 curies C. No source to exceed 500 millicuries  D. No source to exceed 20 millicuries  E. No source to exceed 100 millicuries  F. No source to exceed 15 millicuries  G. No source to exceed 1 curie

U. S. NUCLEAR REGULATORY COMMISSION  
MATERIALS LICENSE

Supplementary Sheet

Continued From Page 1

License Number 37-07653-02

Docket or  
Reference No. \_\_\_\_\_

Amendment No. 35

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
H. Hydrogen 3	H. Plated sources in AID Model 510-600 electron capture detector cells	- H. No source to exceed 200 millicuries
I. Krypton 85	I. Tracerlab Model S-76A Sealed Sources	I. No source to exceed 500 millicuries
J. Cobalt 60	J. Instruments, Inc. Model B-20-14 Sealed Sources	J. No source to exceed 100 millicuries
K. Cesium 137/ Americium 241	K. Troxler Model A-100280 Sealed Sources	K. No source to exceed 10 millicuries of Cesium 137 and 50 millicuries of Americium 241
L. Cesium 137	L. Amersham Model 850233, or 3M Types 4P6M or 4P6E Sealed Sources	L. No source to exceed 2 curies
M. Strontium 90	M. U. S. Radium Model LAB 370-1 Sealed Sources	M. No source to exceed 300 millicuries
N. Cesium 137	N. Ohmart Corporation Model A-2102 Sealed Sources	N. No source to exceed 100 millicuries
O. Cesium 137	O. Ohmart Corporation Model A-2102 Sealed Sources	O. No source to exceed 300 millicuries
P. Cesium 137	P. Texas Nuclear Model 570-57157C Sealed Sources	P. No source to exceed 4 curies

9. Authorized use

- A. and B. For storage only.
- C. For use in Texas Nuclear Model 5191 source holders for level measurement.
- D. For use in Texas Nuclear Model 5192 source holders for level measurement.
- E. For use in Kay-Ray Model 7062P source holders for level measurement.
- F. For use in Hewlett-Packard Model 5830A gas chromatographs for sample analysis.
- G. For use in Carle Model 111H gas chromatographs for sample analysis.

MATERIALS LICENSE

Supplementary Sheet

License Number 37-07653-02

Docket or

Reference No. \_\_\_\_\_

Amendment No. 35

9. Authorized use continued

- H. For use in AID Model 511 gas chromatographs for sample analysis.
- I. For use in Tracerlab Model HUB-76A source holders for thickness measurement.
- J. For use in Instrument, Inc. Model B-20-06 source holders for level measurement.
- K. For use in Troxler Model 2401 soil testing gauges.
- L. For use in Nuclear-Chicago Model 5120 source holders for density measurement.
- M. For use in Ohmart Model LPG-2 source holders for thickness measurement.
- N. For use in Ohmart Model ED-6 source holders for density measurement.
- O. For use in Ohmart Model HM-8 source holders for density measurement.
- P. For use in Texas Nuclear Model 5176 source holders for density or level measurements.

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CONDITIONS

- 10. Licensed material shall be used and stored only at Alcoa Technical Center, Alcoa Center, Pennsylvania and Alcoa Research Laboratory, New Kensington, Pennsylvania.
- 11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
- 12. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Committee, except that material described in Subitems A and P of Items 6., 7., and 8 shall be stored under the supervision of Robert Geiger.
- 13. A. (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
  - (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.
  - (3) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

NUCLEAR REGULATORY COMMISS  
MATERIALS LICENSE  
Supplementary Sheet

License Number 37-07653-02

Docket or  
Reference No. \_\_\_\_\_  
Amendment No. 35

13. continued

- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
  - C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region I, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
  - D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
14. Sealed sources containing licensed material shall not be opened or removed from their respective source holders by the licensee.
15. A. Installation, relocation, initial radiation surveys and removal from service of devices containing licensed material shall be performed by R. C. Geiger or by persons specifically authorized by the Commission or an Agreement State to perform these services on devices possessed by the licensee.
- B. Maintenance and repair of devices containing radioactive material and installation, replacement and disposal of sealed sources containing radioactive material shall be performed by the device manufacturer or by persons specifically authorized to perform these operations on devices possessed by the licensee.
16. A. Detector cells containing titanium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 225 degrees Centigrade.
- B. Detector cells containing scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 325 degrees Centigrade.
17. Detector cells containing nickel 63 shall not be opened nor nickel 63 removed from detector cells.

MATERIALS LICENSE

Supplementary Sheet

License Number 37-07653-02

CONDITIONS

Docket or  
Reference No. \_\_\_\_\_  
Amendment No. 35

(continued)

18. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a) (1), Title 10, Code of Federal Regulations, Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.
19.
  - A. Each chromatograph detector containing Nickel 63 shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a detector received from another person shall not be put into use until tested.
  - B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the surfaces of the device in which the foil is mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
  - C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the foil from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with Region I, Office of Inspection and Enforcement, USNRC, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
  - D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
20. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, location of sealed sources, and the date of the inventory.
21. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material For Transport."

MATERIALS LICENSE

Supplementary Sheet

License Number 37-07653-02

Docket or

Reference No. \_\_\_\_\_

Amendment No. 35

(continued)

22. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in applications dated March 28, 1966, April 28, 1971 and March 13, 1973; letters dated May 8, 1973, September 24, 1976, February 1, 1977, and November 4, 1977; and application dated February 27, 1978 as amended July 21, 1978 and August 31, 1978.

Date OCT 6 1978

*FC 10/6/78*

For the U. S. Nuclear Regulatory Commission  
Original Signed by  
**FREDRICK C. COMBS**  
by Radioisotopes Licensing Branch

Division of Fuel Cycle and  
Material Safety  
Washington, D.C. 20555

**Appendix B**

**DandD Code Output: Ni-63, Am-241, Pm-147**



# DandD Building Occupancy Scenario

**DandD Version:** 2.1.0

**Run Date/Time:** 3/1/2004 11:12:51 AM

**Site Name:** Alcoa Research Laboratory

**Description:** Default Screening Value for Americium 241

**FileName:** C:\Program Files\DandD2\Alcoa\Am-241.mcd

## Options:

**Implicit progeny doses NOT included with explicit parent doses**

**Nuclide concentrations are distributed among all progeny**

**Number of simulations:** 100

**Seed for Random Generation:** 8718721

**Averages used for behavioral type parameters**

**External Pathway is ON**

**Inhalation Pathway is ON**

**Secondary Ingestion Pathway is ON**

## Initial Activities:

Nuclide	Area of Contamination (m <sup>2</sup> )	Distribution
241Am	UNLIMITED	CONSTANT(dpm/100 cm**2)
Justification for concentration: DSV Development		Value 2.40E+01

## Site Specific Parameters:

### General Parameters:

None

### Correlation Coefficients:

None

## Summary Results:

90.00% of the 100 calculated TEDE values are < 2.23E+01 mrem/year .

**The 95 % Confidence Interval for the 0.9 quantile value of TEDE is 1.99E+01 to 2.54E+01 mrem/year**



# DandD Building Occupancy Scenario

**DandD Version:** 2.1.0  
**Run Date/Time:** 3/1/2004 10:42:26 AM  
**Site Name:** Alcoa Research Lab  
**Description:** Default Screening Value Determination  
**FileName:** C:\Program Files\DandD2\Alcoa\Ni-63.mcd

## Options:

**Implicit progeny doses NOT included with explicit parent doses**  
**Nuclide concentrations are distributed among all progeny**  
**Number of simulations:** 100  
**Seed for Random Generation:** 8718721  
**Averages used for behavioral type parameters**

**External Pathway is ON**  
**Inhalation Pathway is ON**  
**Secondary Ingestion Pathway is ON**

## Initial Activities:

Nuclide	Area of Contamination (m <sup>2</sup> )	Distribution
<sup>63</sup> Ni	UNLIMITED	CONSTANT(dpm/100 cm**2)
Justification for concentration: DSV development		Value 1.60E+06

## Site Specific Parameters:

### General Parameters:

None

### Correlation Coefficients:

None

## Summary Results:

90.00% of the 100 calculated TEDE values are < 2.20E+01 mrem/year .

**The 95 % Confidence Interval for the 0.9 quantile value of TEDE is 1.97E+01 to 2.49E+01 mrem/year**



# DandD Building Occupancy Scenario

**DandD Version:** 2.1.0  
**Run Date/Time:** 3/1/2004 11:16:19 AM  
**Site Name:** Alcoa Research Laboratory  
**Description:** Default Screening Value Development  
**FileName:** C:\Program Files\DandD2\Alcoa\Pm-147.mcd

## Options:

**Implicit progeny doses NOT included with explicit parent doses**  
**Nuclide concentrations are distributed among all progeny**  
**Number of simulations:** 100  
**Seed for Random Generation:** 8718721  
**Averages used for behavioral type parameters**

**External Pathway is ON**  
**Inhalation Pathway is ON**  
**Secondary Ingestion Pathway is ON**

## Initial Activities:

Nuclide	Area of Contamination (m <sup>2</sup> )	Distribution
147Pm	UNLIMITED	CONSTANT(dpm/100 cm**2)
Justification for concentration: DSV Development		Value 3.00E+05

## Site Specific Parameters:

### General Parameters:

None

### Correlation Coefficients:

None

## Summary Results:

90.00% of the 100 calculated TEDE values are < 2.19E+01 mrem/year .

— **The 95 % Confidence Interval for the 0.9 quantile value of TEDE is 1.96E+01 to 2.49E+01 mrem/year**

**Appendix C**

**Records Regarding AmBe Density Gauges**

ALUMINUM COMPANY OF AMERICA

ALCOA BUILDING

PITTSBURGH, PENNSYLVANIA 15219



1986 April 25

U.S. Nuclear Regulatory Commission  
Region 1  
631 Park Avenue  
King of Prussia, Pennsylvania 19406

Attention: Doris J. Foster

Dear Ms. Foster:

Pursuant to our telephone conversation of 1986 April 21, we hereby request you to make the following changes in Byproduct Materials License Number 37-07653-02:

Item 6 Delete items D and E. These sources were contained in a Troxler moisture density gauge; this device was returned to the manufacturer in 1985.

Delete items F and G. These sources were contained in a Campbell Pacific Nuclear moisture density gauge; this device was returned to the manufacturer in 1984.

Item 9 In accordance with the aforementioned deletions, please delete 9C, 9D, 9E, 9F, and 9G.

Item 10 Please delete item 10B since this pertains to portable moisture density gauges which we no longer have on site.

Item 12 Please combine items A and B to read "Licensed material listed in sub-item 6 shall be used by, or under the supervision of D. Ray Scott or Joan S. Karas."

Mr. Bussey has resigned from Alcoa; responsibility for radiation safety in Alcoa Laboratories has been assigned to D. Ray Scott and Joan S. Karas. Mr. Scott has primary responsibility for radiation safety. Both individuals have received instruction and guidance in Alcoa's radiation safety policies and procedures including information on licensing, installation, employee dose estimates, leak testing, relocation and emergency procedures specific to sealed source devices. Both individuals have received course work in the field of health physics.

RECEIVED  
MAY 19 10:10  
U.S. NUCLEAR REGULATORY COMMISSION

License Fee Information  
on page 2.

8607310338 860612  
REG1 LIC30  
37-07653-02 PDR

RECEIVED-REGION 1

"OFFICIAL RECORD COPY"

ML1B

105471

MAY 09 1986

U.S. Nuclear Regulatory Commission  
Region 1  
1986 April 25  
Page 2

Mr. Scott has a B.S. in Safety Engineering from Texas A & M University. The curriculum included the three (3) semester-hour course "Principles of Radiation Protection" sponsored by the Department of Nuclear Engineering. Mr. Scott has also registered to attend the Texas Nuclear Inc. "Radiation Safety" seminar in August of this year.

Ms. Karas has a B.S. in Environmental Science from Perdue University and an M.S. in Industrial Hygiene from the University of Michigan. Her graduate program in Michigan included two courses in radiation safety: "Introduction to Bionucleonics" (3 credits) and "Radiation Biology" (3 credits). Together these courses provided basic instruction in health physics.

Item 17 Please replace "P. S. Bussey" with "D. Ray Scott or J. S. Karas".

The required license renewal fee of \$60 is enclosed.

If any additional information is needed, please contact me at (412) 553-4829.

Sincerely,



Joseph Damiano  
Radiation Safety Officer

/pdm

Enclosure

Log	May 9 <sup>th</sup>
Remitter	
Check No.	44805
Amount	\$ 60
Fee Category	3P
Type of Fee	Amendment
Date Check	5/19/86
Date Completed	5/20/86
By:	A. K. [Signature]

ALUMINUM COMPANY OF AMERICA

ALCOA TECHNICAL CENTER

ALCOA CENTER, PA. 15069

(412) 339-6651



1983 September 23

Dr. John E. Glenn  
US Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

*check issued = 1983 Sept 23  
check No. = 0034009  
check cashed 12/30/10*

Dear Dr. Glenn:

We wish to amend Byproduct Material License No. 37-07653-02 to allow the possession and use of the following gauging device:

Campbell Pacific Nuclear Corp. Model MC-1-1225 2-probe density gauge containing a sealed source, Model 131, not to exceed 10 millicuries of Cesium-137 and 50 millicuries of Americium-241.

All other conditions of the license remain the same.

The required amendment fee of \$40 as itemized in Section 170.31(3L) of 10CFR is enclosed.

This equipment will be at these laboratories for evaluation before being transferred to a plant site. Since the gauging device is essential to our plant operations, I would appreciate your cooperation in expediting the processing of this application.

If additional information is needed, feel free to call me at (412) 337-2156.

Sincerely,

A handwritten signature in cursive script that reads "Robert C. Geiger".

Robert C. Geiger  
Radiation Safety Officer

Enclosure (1)

PURCHASE ORDER NUMBER TC962790TC	P.O. DATE 13OCT83	BUYER TC6	AUTH. NUMBER 14C1001553	DATE MATERIAL REQUIRED 03OCT83	DATE SHIPMENT PROMISED NOTE
-------------------------------------	----------------------	--------------	----------------------------	-----------------------------------	--------------------------------

PAGE 3  
ARCADIA CONTROLS INC

VENDOR NUMBER  
061608A00

SHIP TO

ORDER VALUE REQUISITION WRITER

SHIP VIA	F.O.B.	TERMS	IN PLANT DELIVERY LOCATION
----------	--------	-------	----------------------------

ITEM NO.	QUANTITY	UNIT MEAS.	DESCRIPTION AND SPECIFICATIONS	PRICE & UNIT	A - ACCT. CODE S - STOCK NO. C - COMAL CODE	L - STORES LOC T - TAX CODE
H			ATTN: DARLENE YUNDT - PLEASE NOTIFY BOB GEIGER (EXT 2155) WHEN THIS EQUIPMENT ARRIVES AT ATC SO THAT HE CAN MONIYOR IT WITH NUCLEAR TEST EQUIPMENT.			
I			ATTN: BOB GEIGER - PLEASE SEND A COPY OF AMENDED LICENSE TO ATTN: JOE ERDOS (PROCUREMENT - ATC-D) SO THAT A COPY CAN BE SENT TO CHARLES APT AT ARCADIA CONTROLS TO RELEASE THE EQUIPMENT FOR RENTAL.			
J			CC: R.C. GEIGER, ATC-C P.H. ADOMAITIS, ATC-B R.V. PETERSON, NK DARLENE YUNDT, ATC-E PETE BUSSEY, ATC-D			
PM	NN00					

PURCHASING CONTACT  
J. E. ERDOS  
TELEPHONE NUMBER: 412-337-2728

ALUMINUM COMPANY OF AMERICA

J. D. ROYCE  
PROCUREMENT MANAGER  
ALCOA CENTER, PA. 15069  
COPY - 3

PURCHASE ORDER NUMBER TC962790TC	P.O. DATE 13OCT83	BUYER TC6	AUTH. NUMBER 14C1001553	DATE MATERIAL REQUIRED 03OCT83	DATE SHIP PROMISE NOTE
-------------------------------------	----------------------	--------------	----------------------------	-----------------------------------	---------------------------

PAGE 2  
ARCADIA CONTROLS INC

VENDOR NUMBER  
061608A00

SHIP TO

ORDER VALUE	REQUISITION WRITER
SHIP VIA	IN PLANT DELIVERY LOCATION

ITEM NO.	QUANTITY	UNIT MEAS.	DESCRIPTION AND SPECIFICATIONS	PRICE & UNIT	A - ACCT CODE S - STOCK NO. C - COMM. CODE	L - STORES LOC. T - TAX CODE
			RECEIVING HOURS ARE 7:00 A.M. TO 3:00 P.M., MONDAY THROUGH FRIDAY. NO SHIPMENTS WILL BE ACCEPTED AFTER 3:00 P.M., AND DURING THE LUNCH HOUR 12:00 TO 12:30 P.M.			
			CONFIRMING VERBAL ORDER TO SELLER'S CHARLES APT ON 20SEP83, BY OUR J.E.ERDOS, DO NOT DUPLICATE.			
			ALL RENTAL COSTS WILL APPLY TOWARDS PURCHASE.			
			THIS PURCHASE ORDER IS FOR 1983 BUDGET ITEMS. ALL ITEMS MUST BE RECEIVED AT ALCOA TECHNICAL CENTER BY DECEMBER 31, 1983. IF THIS IS NOT POSSIBLE, PLEASE CONTACT J.E.ERDOS AT (412)337-2728 IMMEDIATELY.			
			ALCOA'S RADIATION SAFETY OFFICER BOB GEIGER WILL APPLY TO THE NRC TO AMEND THE LICENSE THAT WILL ALLOW THIS NUCLEAR EQUIPMENT TO BE USED AT ALCOA TECHNICAL CENTER. J.E.ERDOS WILL SEND A COPY OF AMENDED LICENSE TO ARCADIA CONTROLS SO THAT THE EQUIPMENT CAN BE RELEASED FOR RENTAL.			
PM	NN00					

PURCHASING CONTACT  
J. E. ERDOS  
TELEPHONE NUMBER: 412-337-2728

ALUMINUM COMPANY OF AMERICA

J. D. ROYCE  
PROCUREMENT MANAGER  
ALCOA CENTER, PA. 15069  
COPY-3



*Life Bussey JTC-D*

# PURCHASE ORDER

PURCHASE ORDER NUMBER TC962790TC	P.O. DATE 130CT83	BUYER TC6	AUTH. NUMBER 14C1001553	DATE MATERIAL REQUIRED 030CT83	DATE SHIP PROMISE NOTE
-------------------------------------	----------------------	--------------	----------------------------	-----------------------------------	---------------------------

VENDOR NUMBER  
061608A00

ARCADIA CONTROLS INC  
9800 MCKNIGHT ROAD  
PITTSBURGH PA 15237

SHIP TO  
ALUMINUM COMPANY OF AMERICA  
TC962790TC 061608A00  
ALCOA TECHNICAL CENTER  
MAIL: ALCOA CENTER, PENNSYLVANIA 15069  
FREIGHT: 7TH STREET ROAD, ROUTE 780  
ALCOA CENTER, PENNSYLVANIA 15069  
(NEAR NEW KENSINGTON, PA.)

ORDER VALUE \$1,540 REQUISITION WRITER

SHIP VIA MOTOR FREIGHT	F.O.B. SHIPPING POINT	TERMS NET 30 DAYS	IN PLANT DELIVERY LOCATION
---------------------------	--------------------------	----------------------	----------------------------

ITEM NO.	QUANTITY	UNIT MEAS.	DESCRIPTION AND SPECIFICATIONS	PRICE & UNIT	A - ACCT. CODE S - STOCK NO. C - COMM. CODE	L - STORES LOC. T - TAX CODE
	2	MON	RENTAL OF QUANTITY OF ONE CAMPBELL PACIFIC NUCLEAR CORP. NUCLEAR DENSITY MEASUREMENT INSTRUMENT, DESCRIBED AS FOLLOWS: MODEL #MC-1-122 WITH PART #D-101151 STRATA ATTACHMENT WHICH USES TWO 5/8 INCH RODS, ONE WITH SOURCE, ONE WITH DETECTOR, SEPARATED BY 12 INCHES AND ABLE TO GO 12" INTO MATERIAL. NOTE: INSTRUMENT WILL CONTAIN CESIUM 137 AND AMERICIUM 241/BERYLLIUM IN A CPN-131 SEALED CAPSULE, NOT TO EXCEED 10 M CI CS137 AND/OR 50 MCI AM241/BE PER SOURCE PAIR).	\$770.00 MON	14C1001553R95 000	
<p>NOTES:</p> <p>A MAIL INVOICES IN DUPLICATE SHOWING VENDOR NUMBER AND PURCHASE ORDER NUMBER TO ALUMINUM COMPANY OF AMERICA, ALCOA TECHNICAL CENTER, ALCOA CENTER, PENNSYLVANIA 15069.</p> <p>B DO NOT CHARGE PENNSYLVANIA SALES/USE TAX AS WE MAKE PAYMENT DIRECT TO THE STATE UNDER PERMIT NO. 106.</p> <p>PM CONTINUED ON PAGE 2</p>						

PURCHASING CONTACT  
J. E. ERDOS  
TELEPHONE NUMBER: 412-337-2728

ALUMINUM COMPANY OF AMERICA

J. D. ROYCE  
PROCUREMENT MANAGER  
ALCOA CENTER, PA. 15069  
COPY-3

FROM: MARK RIPEPI

TO: MEDICAL DEPT

ATC/B

ATC/C

RE: RADIATION BADGES FOR CAMPBELL PACIFIC NUCLEAR GAGE

Evaluation of the above referenced equipment is complete. This gage has been shipped back to the manufacturer. There is no longer a need to have the radiation badges sent to the following:

G1	1063	— MARK RIPEPI
G1	1064	— HOWARD RIDENOUR
1-03	1062	— DICK PETERSON
G1	1061	— DOUGLAS DAVIS

Acc No 60249

Number

Mark

84/07/03

2 Bob Geiger ATC/C

COMPANY: ALUMINUM COMPANY OF AMERICA

ADDRESS: 7th Street, Route 780

CITY/STATE: Alcoa Center, PA 15069

Receipt of Radioactive Material

This will acknowledge receipt of the below listed radioactive material. This material received is transferred to TROXLER ELECTRONIC LABORATORIES, INC. under North Carolina Radioactive Material License #32-182-1. You should retain this letter in your files to document your disposal of the equipment.

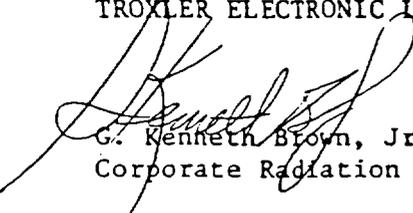
Received:

Gauge: (Model and Serial Number) 2401-3133

Material: (Type and Quantity) Cs-137/Am-241:Be 7.4/50 mCi

Date Received: 12/27/83

TROXLER ELECTRONIC LABORATORIES, INC.

  
G. Kenneth Brown, Jr.  
Corporate Radiation Safety Officer

*J. R. Sarazin*

8/1/81

*Filed*

### Leak Test Analysis

Radionuclide: \_\_\_\_\_  
Source Serial: AL-4738  
Inst. Model: 2401  
Inst. Serial: 3133  
Date of Wipe: 81 DEC 03  
Individual's Name: J.R. SARAZIN  
Telephone: 319-359-2892

Removable Activity	
Beta Gamma	Alpha
<u>0</u> $\mu\text{Ci}$	<u>0</u> $\mu\text{Ci}$
<u><i>Paula Bridges</i></u> Certification	
Date: <u>12/10/81</u>	

PLEASE TYPE OR PRINT LEGIBLY -  
THIS IS YOUR RETURN ADDRESS LABEL

- J.R. SARAZIN
- ALCOA Construction
- P.O. Box 972
- Bettendorf, IA. 52722

### NOTES

1. Follow procedures as defined in your leak test kit instructions.
2. Fill out this form and the bag label with required information where applicable. Seal the filter paper in the plastic bag. Place the plastic bag and this form in the pre-addressed envelope.
3. Removable activity will be reported in  $\mu\text{Ci}$ . A value of "0" indicates less than .00005  $\mu\text{Ci}$ .
4. Federal and state regulations require that sealed sources be removed from service and reports filed if removable activity is greater than .005  $\mu\text{Ci}$ .
5. Due to the potential hazard, Troxler recommends that an additional wipe be made if removable activity exceeds .0005  $\mu\text{Ci}$ .
6. You will be notified by telephone collect if the test yields greater

ORIGINAL

Radionuclide:  
Source Serial: AC-4738  
Inst. Model: 2401  
Inst. Serial: 3133  
Date of Wipe: 81 June 26  
Individual's Name: K. Shipley  
Telephone: (319) 359-2894

PLEASE TYPE OR PRINT LEGIBLY -  
THIS IS YOUR RETURN ADDRESS LABEL

- KARL L. SHIPLEY
- ALCOA CONSTRUCTION
- PO BOX 972
- BETTENDORF, IA 52722

Troxler Electronic Laboratories, Inc., P.O. Box 12057, Research Triangle Park, N.C. 27709 919/549-8661 Telex 579474

### Leak Test Analysis

Removable Activity	
Beta Gamma	Alpha
<u>0</u> $\mu$ Ci	<u>0</u> $\mu$ Ci
<u>Claudia Santos</u> Certification	
Date: <u>6-30-81</u>	

### NOTES

1. Follow procedures as defined in your leak test kit instructions.
2. Fill out this form and the bag label with required information where applicable. Seal the filter paper in the plastic bag. Place the plastic bag and this form in the pre-addressed envelope.
3. Removable activity will be reported in  $\mu$ Ci. A value of "0" indicates less than .00005  $\mu$ Ci.
4. Federal and state regulations require that sealed sources be removed from service and reports filed if removable activity is greater than .005  $\mu$ Ci.
5. Due to the potential hazard, Troxler recommends that an additional wipe be made if removable activity exceeds .0005  $\mu$ Ci.
6. You will be notified by telephone collect if the test yields greater than .001  $\mu$ Ci removable activity.

ORIGINAL

Radionuclide: \_\_\_\_\_  
Source Serial: AC-4738  
Inst. Model: 2401  
Inst. Serial: 3133  
Date of Wipe: 1980 OCT 6  
Individual's Name: K. L. Shipley  
Telephone: (319) 359-2894

PLEASE TYPE OR PRINT LEGIBLY -  
THIS IS YOUR RETURN ADDRESS LABEL

• K. L. SHIPLEY  
• ALCOA CONSTRUCTION  
• PO BOX 972  
• BETTENDORF IA 52722

Troxler Electronic Laboratories, Inc., P.O. Box 12057, Research Triangle Park, N.C. 27709 919/549-8661 Telex 579474

### Leak Test Analysis

Removable Activity	
Beta Gamma	Alpha
<u>0</u> $\mu\text{Ci}$	<u>0</u> $\mu\text{Ci}$
<u>Claudia Sanders</u> Certification	
Date: <u>10-10 80</u>	

### NOTES

1. Follow procedures as defined in your leak test kit instructions.
2. Fill out this form and the bag label with required information where applicable. Seal the filter paper in the plastic bag. Place the plastic bag and this form in the pre-addressed envelope.
3. Removable activity will be reported in  $\mu\text{Ci}$ . A value of "0" indicates less than .00005  $\mu\text{Ci}$ .
4. Federal and state regulations require that sealed sources be removed from service and reports filed if removable activity is greater than .005  $\mu\text{Ci}$ .
5. Due to the potential hazard, Troxler recommends that an additional wipe be made if removable activity exceeds .0005  $\mu\text{Ci}$ .
6. You will be notified by telephone collect if the test yields greater than .001  $\mu\text{Ci}$  removable activity.

ORIGINAL

Radionuclide: \_\_\_\_\_  
Source Serial: AC-4738  
Inst. Model: 2401  
Inst. Serial: 3133  
Date of Wipe: 1980 MAY 12  
Individual's Name: K.L. SHIPLEY  
Telephone: (319) 357-2894

PLEASE TYPE OR PRINT LEGIBLY -  
THIS IS YOUR RETURN ADDRESS LABEL

• K. L. SHIPLEY  
• ALCOA CONSTRUCTION  
• PO BOX 972  
• BETTENDORF, IA 52722

### Leak Test Analysis

Removable Activity	
Beta Gamma	Alpha
<u>0</u> $\mu$ Ci	<u>0</u> $\mu$ Ci
<u>Charles Shipley</u> Certification	
Date: <u>5-16-80</u>	

### NOTES

1. Follow procedures as defined in your leak test kit instructions.
2. Fill out this form and the bag label with required information where applicable. Seal the filter paper in the plastic bag. Place the plastic bag and this form in the pre-addressed envelope.
3. Removable activity will be reported in  $\mu$ Ci. A value of "0" indicates less than .00005  $\mu$ Ci.
4. Federal and state regulations require that sealed sources be removed from service and reports filed if removable activity is greater than .005  $\mu$ Ci.
5. Due to the potential hazard, Troxler recommends that an additional wipe be made if removable activity exceeds .0005  $\mu$ Ci.
6. You will be notified by telephone collect if the test yields greater than .001  $\mu$ Ci removable activity.

ORIGINAL

# RADIOACTIVE SOURCE CERTIFICATE

Code	_____	Customer Number	<u>A1547TXDS</u>
Source Number	_____	Code	<u>64</u>
Type	_____	Source Number	<u>AC-4817</u>
Type of Radiation	_____	Type	<u>Cs/Am:Be</u>
Activity	_____	Type of Radiation	<u>Gamma/Neutron</u>
Neutron Output	_____	Activity	<u>8.2/50 mCi</u>
		Neutron Output	<u>1.2 x 10<sup>5</sup> NPS</u>

Sources are encapsulated in stainless steel, Special Form Type A containers

\_\_\_\_\_ DATE OF MEASUREMENT 9-10-74

## WIPE TEST RECORD

\_\_\_\_\_ Less than .005 micro-curies  
removable contamination.  
\_\_\_\_\_ Sensitive wipe test negative  
\_\_\_\_\_ Sensitive wipe test negative  
\_\_\_\_\_ Sensitive wipe test negative

## WIPE TEST RECORD

\_\_\_\_\_ 1-22-75  
\_\_\_\_\_  
\_\_\_\_\_

## ORIGINAL USE

Enclosed in Model 2401, Serial No. 3145  
Date Shipped Jan 22, 1975

To ALCOA  
P.O. Box 1491  
Rockdale, Texas 76567

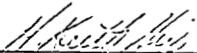
Customer P. O. No. RC912381 License No. TX7-1846AM  
W. O. No. 5906 Phone: 512 446 2359

## RECOMMENDATIONS

1. Treat radioactive source with respect.
2. Do not touch with hands or body. Use tongs.
3. Do not expose to personnel.
4. Wipe test every six months.
5. If dropped, or struck, immediately wipe test.
6. Consult your Radiological Safety Officer on shipping, handling and surveillance procedures.
7. If questions arise contact Troxler Electronic Laboratories, Inc.
8. Wipe Test Kits available.

## CLASSIFICATION OF RADIOACTIVE SOURCE

According to regulations of the Department of Transportation, this source is Special Form, Radioactive Yellow-II. Whenever shipped by public carrier, a special shipping label is required.

  
RADIOLOGICAL SAFETY OFFICER  
H. Keith Hix



P. O. BOX 5997

RALEIGH, N. C. 27607 USA

Manufacturers of Surface Moisture, Surface Density, Depth Moisture, and Depth Density Equipment

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 12057  
RESEARCH TRIANGLE PARK, NC 27709

XX  
XX  
XX

LEAK TEST REPORT

CUSTOMER: ALCOA  
Rockdale, Texas

DATE OF TEST 6-19-75

BACKGROUND: ALPHA: 0 cpm BETA/GAMMA: 13 cpm

SOURCE SERIAL NO.	GAUGE		RESULTS	
	MODEL	SERIAL NO.	ALPHA (cpm)	BETA/GAMMA (cpm)
C-4817	2401	3145	0	0

COMMENTS: Less than 0.005  $\mu$ c removable contamination.

EQUIPMENT: Nuclear Measurement Corp., Model PCC-11T, gas flow internal proportional counter, 10% methane - 90% argon mixture.

CONVERSION FACTORS: 1 Alpha cpm =  $8.78 \times 10^{-7} \mu$ c; 1 Beta/Gamma cpm =  $6.95 \times 10^{-7} \mu$ c.

*H. Keith Hix*  
Assistant Radiological Safety Officer  
H. Keith Hix

~~TEXT/JPG/File~~

Troxler Nuclear -  
Wipe Test

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 12057  
RESEARCH TRIANGLE PARK, N. C. 27709

LEAK TEST REPORT

CUSTOMER: ALCOA  
Rockdale, Texas

DATE OF TEST 12-30-75

SOURCE SERIAL NO.	GAUGE		RESULTS (10 <sup>-12</sup> curies)	
	MODEL	SERIAL NO.	ALPHA	BETA/GAMMA
AC-4817	2401	3145	0.	0.

COMMENTS: Less than 0.005 µc removable contamination.  
Results given in picoCuries or 10<sup>-12</sup> curies

EQUIPMENT: Nuclear Measurement Corporation, Model PCC-11T, gas flow internal proportional counter, 10% methane - 90% argon mixture.

Calibration of counter is made each day with calibrated standards of Americium<sup>241</sup> Cesium<sup>137</sup> and Chlorine<sup>36</sup> - each traceable to Bureau of Standards.

*H. Keith Hix*  
Assistant Radiological Safety Officer  
H. Keith Hix

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 12057  
RESEARCH TRIANGLE PARK, N. C. 27709

LEAK TEST REPORT

CUSTOMER: Aluminum Co. of America  
Rockdale, Texas 76567

~~FILE~~ / JFG / File  
*For the Nuclear  
wipe Test*

DATE OF TEST 6-16-76

SOURCE SERIAL NO.	GAUGE		RESULTS ( $10^{-12}$ curies)	
	MODEL	SERIAL NO.	ALPHA	BETA/GAMMA
AC-4817	2401	3145	0.	0.

COMMENTS: Less than 0.005  $\mu\text{c}$  removable contamination.  
Results given in picoCuries or  $10^{-12}$  curies

EQUIPMENT: Nuclear Measurement Corporation, Model PCC-11T, gas flow internal proportional counter, 10% methane - 90% argon mixture.

Calibration of counter is made each day with calibrated standards of Americium<sup>241</sup>, Cesium<sup>137</sup> and Chlorine<sup>36</sup> - each traceable to Bureau of Standards.

*H. Keith Hix*  
Assistant Radiological Safety Officer

H. Keith Hix

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 12057  
RESEARCH TRIANGLE PARK, N. C. 27709

LEAK TEST REPORT

CUSTOMER: ALUMINUM COMPANY OF AMERICA  
Construction Division  
P.O. Box 1491  
Rockdale, Texas 76567

*L. O. H. Hix*  
2/1/77

ATTENTION: T.J. HORMUTH

DATE OF TEST 7-7-77

SOURCE SERIAL NO.	GAUGE		RESULTS(10 <sup>-12</sup> curies)	
	MODEL	SERIAL NO.	ALPHA	BETA/GAMMA
AC-4817	2401	3145	.0	.0

COMMENTS: Less than 0.005  $\mu$ c removable contamination.  
Results given in picoCuries or 10<sup>-12</sup> curies

EQUIPMENT: Nuclear Measurement Corporation, Model PCC-11T, gas flow internal proportional counter, 10% methane - 90% argon mixture.

Calibration of counter is made each day with calibrated standards of Americium<sup>241</sup>, Cesium<sup>137</sup> and Chlorine<sup>36</sup> - each traceable to Bureau of Standards.

*H. Keith Hix*  
H. Keith Hix  
Assistant Radiological Safety Officer

COMPANY: ALUMINUM COMPANY OF AMERICA

ADDRESS: 7th Street, Route 780

CITY/STATE: Alcoa Center, PA 15069

Receipt of Radioactive Material

This will acknowledge receipt of the below listed radioactive material. This material received is transferred to TROXLER ELECTRONIC LABORATORIES, INC. under North Carolina Radioactive Material License #32-182-1. You should retain this letter in your files to document your disposal of the equipment.

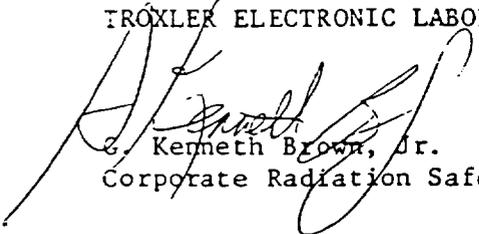
Received:

Gauge: (Model and Serial Number) 2401-3145

Material: (Type and Quantity) Cs-137/Am-241:Be 8.2/50 mCi

Date Received: 12/27/83

TROXLER ELECTRONIC LABORATORIES, INC.



G. Kenneth Brown, Jr.  
Corporate Radiation Safety Officer

RADIOACTIVE SOURCE CERTIFICATE



®

Source Number 3443  
 Type Cs/AM:BE  
 Type of Radiation Gamma/Neutron  
 Activity 7.8/50 mCi  
 Neutron Output 1.4X10\*\*5 nps

Sources are double encapsulated in stainless steel or monel.

DATE OF MEASUREMENT 5/24/72

WIPE TEST RECORD

9/22/72  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Less than .005 micro-curies removable contamination.  
 Sensitive wipe test negative  
 Sensitive wipe test negative  
 Sensitive wipe test negative

ORIGINAL USE

Enclosed in Model 2401, Serial No. 1739

Date Shipped 9/22/72

To Aluminum Company of America  
Construction Department  
P. O. Box 150  
Massena, New York 13662

Customer P. O. No. P 623476, License No. 2028-0958

W. O. No. 4231

AEC

RECOMMENDATIONS

1. Treat radioactive source with respect.
2. Do not touch with hands or body. Use tongs.
3. Do not expose to personnel.
4. Wipe test every six months.
5. If dropped, or struck, immediately wipe test.
6. Consult your Radiological Safety Officer on shipping, handling and surveillance procedures.
7. If questions arise contact Troxler Electronic Laboratories, Inc.
8. Wipe Test Kits available.

CLASSIFICATION OF RADIOACTIVE SOURCE

According to regulations of the Department of Transportation, this source is Special Form, Radioactive Yellow-II. Whenever shipped by public carrier, a special shipping label is required.

*Miles A. Hughes, Jr.*  
 Miles A. Hughes, Jr.

RADIOLOGICAL SAFETY OFFICER

TROXLER ELECTRONIC LABORATORIES, INC.

HIGHWAY 70 WEST

P. O. BOX 5997

RALEIGH, N. C. 27607 USA

Manufacturers of Surface Moisture, Surface Density, Depth Moisture, and Depth Density Equipment

© 0013350

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 5997  
RALEIGH, NORTH CAROLINA 27607

LEAK TEST REPORT

CUSTOMER: Aluminum Company of America  
Massena, New York

DATE OF TEST 6-12-73

BACKGROUND: ALPHA: 0 cpm BETA/GAMMA: 34 cpm

SOURCE SERIAL NO.	GAUGE		RESULTS	
	MODEL	SERIAL NO.	ALPHA (cpm)	BETA/GAMMA (cpm)
3	2401	1739	0	34

COMMENTS:

Less than 0.005  $\mu$ c removable contamination.

Invoice # X-0701

EQUIPMENT: Nuclear Measurement Corp., Model PCC-11T, gas flow internal proportional counter, 10% methane - 90% argon mixture.

CONVERSION FACTORS: 1 Alpha cpm =  $8.78 \times 10^{-7} \mu$ c; 1 Beta/Gamma cpm =  $6.95 \times 10^{-7} \mu$ c.

*Gene Tommerdahl*  
Assistant Radiological Safety Officer  
Gene Tommerdahl

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 5997  
RALEIGH, NORTH CAROLINA 27607

LEAK TEST REPORT

CUSTOMER:

ALCOA  
Massena, New York

DATE OF TEST 1-10-74

BACKGROUND: ALPHA: 0 cpm BETA/GAMMA: 28 cpm

SOURCE SERIAL NO.	GAUGE		RESULTS	
	MODEL	SERIAL NO.	ALPHA (cpm)	BETA/GAMMA (cpm)
3443	2401	1739	0	26

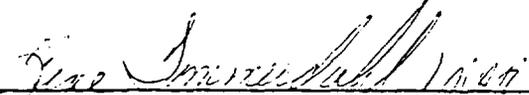
COMMENTS:

Less than 0.005  $\mu$ c removable contamination.

R.O. 7702

EQUIPMENT: Nuclear Measurement Corp., Model PCC-11T, gas flow internal proportional counter,  
10% methane - 90% argon mixture.

CONVERSION FACTORS: 1 Alpha cpm =  $8.78 \times 10^{-7}$   $\mu$ c; 1 Beta/Gamma cpm =  $6.95 \times 10^{-7}$   $\mu$ c.

  
Assistant Radiological Safety Officer  
Gene Tommerdahl

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 5997  
RALEIGH, NORTH CAROLINA 27607

LEAK TEST REPORT

CUSTOMER: ALCOA  
Messena, New York

DATE OF TEST 5-27-74

BACKGROUND: ALPHA: 0 cpm BETA/GAMMA: 15 cpm

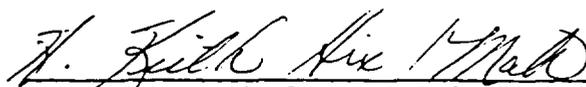
SOURCE SERIAL NO.	GAUGE		RESULTS	
	MODEL	SERIAL NO.	ALPHA (cpm)	BETA/GAMMA (cpm)
3443	2401	1739	0	6

COMMENTS: Less than 0.005  $\mu\text{c}$  removable contamination.

R.O. 7998

EQUIPMENT: Nuclear Measurement Corp., Model PCC-11T, gas flow internal proportional counter,  
10% methane - 90% argon mixture.

CONVERSION FACTORS: 1 Alpha cpm =  $8.78 \times 10^{-7}$   $\mu\text{c}$ ; 1 Beta/Gamma cpm =  $6.95 \times 10^{-7}$   $\mu\text{c}$ .

  
Assistant Radiological Safety Officer  
H. Keith Hix

TROXLER ELECTRONIC LABORATORIES, INC.  
POST OFFICE BOX 5997  
RALEIGH, NORTH CAROLINA 27607

LEAK TEST REPORT

CUSTOMER: ALCOA  
Box 627  
Massena, New York

DATE OF TEST 11-13-74

BACKGROUND: ALPHA: 0 cpm

BETA/GAMMA: 8 cpm

SOURCE SERIAL NO.	GAUGE		RESULTS	
	MODEL	SERIAL NO.	ALPHA (cpm)	BETA/GAMMA (cpm)
3443	2401	1739	0	1

COMMENTS:

Less than 0.005  $\mu$ c removable contamination.

EQUIPMENT: Nuclear Measurement Corp., Model PCC-11T, gas flow internal proportional counter, 10% methane - 90% argon mixture.

CONVERSION FACTORS: 1 Alpha cpm =  $8.78 \times 10^{-7} \mu$ c; 1 Beta/Gamma cpm =  $6.95 \times 10^{-7} \mu$ c.

  
Assistant Radiological Safety Officer

H. Keith Hix

TROXLER ELECTRONIC LABORATORIES, INC.  
 POST OFFICE BOX 12057  
 RESEARCH TRIANGLE PARK, NC 27709

~~XX~~  
~~XX~~  
~~XX~~

LEAK TEST REPORT

CUSTOMER: ALCOA  
 Massena, N.Y.

DATE OF TEST 6-4-75

BACKGROUND: ALPHA: 0 cpm BETA/GAMMA: 5 cpm

SOURCE SERIAL NO.	GAUGE		RESULTS	
	MODEL	SERIAL NO.	ALPHA (cpm)	BETA/GAMMA (cpm)
?	2401	1739	0	0

COMMENTS: Less than 0.005  $\mu$ c removable contamination.

EQUIPMENT: Nuclear Measurement Corp., Model PCC-11T, gas flow internal proportional counter, 10% methane - 90% argon mixture.

CONVERSION FACTORS: 1 Alpha cpm =  $8.78 \times 10^{-7} \mu$ c; 1 Beta/Gamma cpm =  $6.95 \times 10^{-7} \mu$ c.

*H. Keith Hix*  
 Assistant Radiological Safety Officer  
 H. Keith Hix



From

K. P. KARSTEN  
WARRICK OPERATIONS

To

P. S. BUSSEY  
ALCOA TECHNICAL CENTER

1985 September 10

RE: NOTIFICATION OF RECEIPT FOR DISPOSAL - TROXLER GAUGE

At long last we have received written confirmation that Troxler Electronic Laboratories, Inc. has received shipment of the moisture density gauge Model 2401 S/N 1739. As you are well aware, we had verbal confirmation shortly after their receipt. However, it has taken several months to obtain the written document despite numerous phone calls and letters.

I hope the attached copy of the receipt is satisfactory evidence in your response to the NRC. If I can be of further assistance, hopefully with greater punctuality than Troxler, please contact me.

Sincerely,

K. P. Karsten

cc: J. W. Rose - Bldg 01  
J. Damiano - Pgh

528021

RECEIPT OF RADIOACTIVE MATERIAL FOR DISPOSAL

COMPANY: Aluminum Co. of Amer. Const. Dept.  
ADDRESS: P. O. Box 10  
State Route 66  
CTY/STA: Newburgh, IN 47630

This will acknowledge receipt of the below listed radioactive material. This material received is transferred to TROXLER under North Carolina Radioactive Materials License #32-182-1. You should retain this letter in your files to document your disposal of the radioactive material.

GAUGE MODEL: 2401 GAUGE SERIAL: 1739  
RADIONUCLIDE: Cs-137/Am-241:Be mCi: 7.8/50  
DATE RECEIVED: 5/20/85

TROXLER ELECTRONIC LABORATORIES, INC.

*Martin W. Buzel*

*for* G. Kenneth Brown, Jr.  
Corporate Radiation Safety Officer

RECEIVED

MAY 20 1985

NUCLEAR CONSTRUCTION  
ACQUISITION

**Appendix D**

**US NRC License No. 37-07653-02 History**

License 37-7653-2D60 Issued 18Apr 1958 – Rev. 0

Item	Isotope	Qty	Form	Notes
A.	H-3	25 Ci	Any	
B.	Sr-90	10 mCi	Any	
C.	Sr-90	13.5 mCi	Sealed Source Tracerlab S-2A	Tracerlab BG-1 holder
D.	Byproduct Material 3-83 ex. Sr-90	2Ci ea, 10 Ci total	Any	

Note: This license superceded 37-7653-1 issued 29 Feb 1956.

Location of use is:

Alcoa Research Laboratories  
Freeport Road  
New Kensington, PA

Amendment 1 to License 37-7653-2D60 Issued 4Apr 1960

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 3-83	2Ci ea, except Sr-90 – 10 mCi 10 Ci total	Any	
B.	Sr-90	13.5 mCi	Sealed Source Tracerlab S-2A	
C.	H-3	50 Ci	Any	

Location of use is:

Alcoa Research Laboratories  
Freeport Road  
New Kensington, PA

Amendment 2 to License 37-7653-2D62 Issued 20 Sep 1961

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 1-83	2Ci ea, except Sr- 90	Any	
B.	Sr-90	10 mCi 10 Ci total w/ above	Any	
C.	Sr-90	13.5 mCi	Sealed Source Tracerlab S-2A	
D.	H-3	50 Ci	Any	

Location of use is:

Alcoa Research Laboratories  
Freeport Road  
New Kensington, PA

This amendment also authorized use of Sr-90 sealed source at:

Alcoa  
Fabricating Works  
Foil Mill  
12<sup>th</sup> St. & 2<sup>nd</sup> Ave.  
New Kensington, PA

Amendment 3 to 37-7653-2(D64) 27 Apr 1962 – Renewal

Amendment 4 to 37-7653(D64) 15 Jun 1962 – Administrative Change

Amendment 5 to 73-7653(D64) 9 Jan 1964 – Added:

Item	Isotope	Qty	Form	Notes
E.	Co-60	100 mCi	Sealed Source Instruments, Inc. Model B-20-14	To be used in Instruments, Inc. Model B-20-06 Source Holder for level determination in fluidized bed vessel

Amendment 6 to 37-7653-2(D66) 3 Apr 1964

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 3-83 ex. Sr-90	2Ci ea	Any	
B.	Sr-90	10 mCi	Any	
C.	Sr-90	13.5 mCi	Sealed Source Tracerlab S-2A	
D.	Co-60	100 mCi	Sealed Source Instruments, Inc Model B-20-14	
E.	H-3	50 Ci	Any	

Location of use is:

Alcoa Research Laboratories  
 Freeport Road  
 New Kensington, PA

This amendment also authorized use of Sr-90 sealed source at:

Alcoa  
 Fabricating Works  
 Foil Mill  
 12<sup>th</sup> St. & 2<sup>nd</sup> Ave.  
 New Kensington, PA

Amendment 7 to 37-7653-2(D66) 14 May 1964 Added:

Item	Isotope	Qty	Form	Notes
F.	Tl-204	2 mCi	Sealed Source E. K. Cole, Ltd. Model SKS-230- 189	Latronics Corp. Source Unit For Thickness Gauging Also authorized for use at Alcoa Eqmt. Devel. Div. 2210 Harvard Ave, Cleveland OH

Amendment 8 to 37-7653-2 (D66) 27 July 1964 Added a second 100 mCi Co-60 source to Item D.

Additional locations of use:

C.: Alcoa Fabricating Works, Foil Mill 12<sup>th</sup> St. & 2<sup>nd</sup> Ave., New Kensington, PA  
 D.: Alcoa Smelting Process Development Lab, Alcoa, TN  
 F.: Alcoa Eqmt. Dev. Div. 2210 Harvard Ave. ,Cleveland, OH

Amendment 9 to 37-7653-2(D66) 27 Aug 1964 – Increased Sr-90 to 50 mCi

Also, sealed source gauging devices authorized for use at:

Alcoa, 12<sup>th</sup> St. & 2nd Ave. New Kensington, PA  
 Alcoa, Russell Ave., Edgewater, NJ  
 Alcoa, Alcoa, TN

Alcoa, Alcoa Eqmt. Dev. Div., 2210 Harvard Ave, Cleveland, OH  
 Alcoa, East Davenport, IA

Amendment 10 to 37-7653-2(D66) DD MMM (illegible) 1965 Added:

Item	Isotope	Qty	Form	Notes
G.	Sr-90	300 mCi	Sealed Source U.S. Radium Model LAB 370-1	Ohmart Model LBG-2 Source Holder For Thickness Gauging

Amendment 11 to 37-7653-2(D68) 25 Apr 1966 - Renewal

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 3-83 ex. Sr-90	2Ci ea	Any	
B.	Sr-90	50 mCi	Any	
C.	H-3	50 Ci	Any	
D.	Sr-90	13.5 mCi	Sealed Source Tracerlab S-2A	Tracerlab BG-1 holder. For thickness gauge.
E.	Co-60	2 sources of 100 mCi	Sealed Source Instruments, Inc Model B-20-14	To be used in Instruments, Inc. Model B-20-06 Source Holder for level determination in fluidized bed vessel
F.	Sr-90	300 mCi	Sealed Source U.S. Radium Model LAB 370-1	Ohmart Model LBG-2 Source Holder For Thickness Gauging

Sealed source gauging devices authorized for use at:  
 12<sup>th</sup> St. & 2nd Ave. New Kensington, PA  
 2210 Harvard Ave, Cleveland, OH  
 East Davenport, IA  
 2900 Missouri Ave., East St. Louis, MO

Amendment 12 to 37-7653-2(D66) 28 Jun 1966 Added:

Item	Isotope	Qty	Form	Notes
G.	Sr-90	10 mCi	Sealed Sources Nuclear Chicago Model RG-31A1	Pratt & Whitney Model A, B,C, D, E, F, or FA thickness gauges

Amendment 13 to 37-07653-02 3Aug 1966 Added:  
 Tool wear studies at 15<sup>th</sup> St., Arnold, PA

Amendment 14 to 37-07653-02 9 Feb 1967 Added:  
 Sealed source authorized use location of 7<sup>th</sup> Street Rd., Rt. 780, New Kensington, PA.

Amendment 15 to 37-07653-02 10 May 1967 Added:  
 Tool wear studies at 7<sup>th</sup> Street Rd., Rt. 780, New Kensington, PA

Amendment 16 to 37-07653-02 9 Apr 1968 – Renewal to 30 Apr 1973

Amendment 17 to 37-07653-02 7 Feb 1969 Added:

Item	Isotope	Qty	Form	Notes
H.	Pu-238	1 source 30 mCi	Sealed Source Radiochemical Centre Model PPC- 5	For use in Texas Nuclear Corp. Model 465 analyzer (xrf)

Amendment 18 to 37-07653-02 18 Mar 1969 Added:

Item	Isotope	Qty	Form	Notes
I.	Pm-147	1 source 500 mCi	Sealed Source Radiochemical Centre Model PHX-7	For use in Texas Nuclear Corp. Model 465 analyzer (xrf)

Amendment 19 to 37-07653-02 17 Apr 1969 Added:

Item	Isotope	Qty	Form	Notes
J.	Kr-85	500 mCi	Sealed Source Tracerlab S-76	Tracerlab HSB-76 Paint thickness gauge

Amendment 20 to 37-07653-02 7 May 1969

Correction to Amendment 19 Source is Tracerlab S-76A, device is Tracerlab HUB-76A.

Amendment 21 to 37-07653-02 9 Jul 1969

Allowed subitem H. to be used at temporary jobsites throughout Utah.

Amendment 22 to 37-07653-02 15 Oct 1969 Added:

Item	Isotope	Qty	Form	Notes
K.	Cs-137	2 Ci	Sealed Source Amersham-Searle Model 850233, 3M Type 4P6M or 4P6E	Nuclear-Chicago Model 5120 liquid density gauge.

Additional sealed source authorized use location:  
 Logan's Ferry Plant, New Kensington, PA

Amendment 23 to 37-07653-02 1 Feb 1971- Administrative Change

Amendment 24 to 37-07653-02 1 Apr 1971 Added:

Item	Isotope	Qty	Form	Notes
L.	Kr-85	500 mCi	Sealed Source Tracerlab S-76a	Storage in Tracerlab HUB-76A source holder.

Amendment 25 to 37-07653-02 14 May 1971 – Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 3-83 ex. Sr-90	2Ci ea	Any	
B.	Sr-90	50 mCi	Any	
C.	H-3	50 Ci	Any	

D.	Sr-90	13.5 mCi	Sealed Source Tracerlab S-2A	Tracerlab BG-1 holder. For thickness gauge.
E.	Co-60	2 sources of 100 mCi	Sealed Source Instruments, Inc Model B-20-14	To be used in Instruments, Inc. Model B-20-06 Source Holder for level determination in fluidized bed vessel
F.	Sr-90	300 mCi	Sealed Source U.S. Radium Model LAB 370-1	Ohmart Model LBG-2 Source Holder For Thickness Gauging
G.	Sr-90	10 mCi	Sealed Sources Nuclear Chicago Model RG-31A1	Pratt & Whitney Model A, B, C, D, E, F, or FA thickness gauges
H.	Pu-238	1 source 30 mCi	Sealed Source Radiochemical Centre Model PPC-5	For use in Texas Nuclear Corp. Model 465 analyzer (xrf)
I.	Pm-147	1 source 500 mCi	Sealed Source Radiochemical Centre Model PHX-7	For use in Texas Nuclear Corp. Model 465 analyzer (xrf)
J.	Kr-85	500 mCi	Sealed Source Tracerlab S-76	Tracerlab HSB-76 Paint thickness gauge
K.	Cs-137	2 Ci	Sealed Source Amersham-Searle Model 850233, 3M Type 4P6M or 4P6E	Nuclear-Chicago Model 5120 liquid density gauge.
L.	Kr-85	500 mCi	Sealed Source Tracerlab S-76a	Storage in Tracerlab HUB-76A source holder.

Authorized use location is 7<sup>th</sup> Street Rd., Rt. 780 Merwin, PA and Freeport Rd. New Kensington, PA except sealed sources in gauges and analytical devices may be used at Alcoa facilities throughout non-Agreement States.

Amendment 26 to 37-07653-02 1 Jul 1971 – Removes Freeport Rd., New Kensington, PA from Authorized use locations.

Amendment 27 to 37-07653-02 9 Dec 1971 – Added:

Item	Isotope	Qty	Form	Notes
M.	Pu-238	263 mg	Sealed Source Monsanto Research Corp. custom neutron source	Use in custom neutron activation analysis system.

Amendment 28 to 37-07653-02 12 Apr 1973- Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 3-83 ex. Sr-90	2Ci ea	Any	
B.	Sr-90	50 mCi	Any	
C.	H-3	50 Ci	Any	
D.	Co-60	2 sources of 100 mCi	Sealed Source Instruments, Inc Model B-20-14	To be used in Instruments, Inc. Model B-20-06 Source Holder for level determination in fluidized bed vessel
E.	Sr-90	300 mCi	Sealed Source U.S. Radium Model LAB 370-1	Ohmart Model LBG-2 Source Holder For Thickness Gauging
F.	Kr-85	500 mCi	Sealed Source Tracerlab S-76	Tracerlab HSB-76 Paint thickness gauge
G.	Cs-137	2 Ci	Sealed Source Amersham-Searle Model 850233, 3M Type 4P6M or 4P6E	Nuclear-Chicago Model 5120 liquid density gauge.
H.	Kr-85	500 mCi	Sealed Source Tracerlab S-76a	Storage in Tracerlab HUB- 76A source holder.
I.	Pu-238	263 mg	Sealed Source Monsanto Research Corp. custom neutron source	Use in custom neutron activation analysis system.

Authorized use locations:

All materials: Alcoa Technical Center, Alcoa Center, PA

Sealed sources in gauges:

Alcoa, Cleveland, OH

Alcoa, Davenport, IA

Alcoa, New Kensington, PA

Note: Several sources deleted in this amendment.

Amendment 29 to 37-07653-02 4 Jun 1973- Rewrite

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 3-83 ex. Sr-90, H-3	2Ci ea	Any	
	H-3	20 Ci	Any	
	Sr-90	50 mCi	Any	
B.	Co-60	5 Ci Total	Sealed Sources	
C.	Sr-90	3 Ci Total	Sealed Sources	
D.	Kr-85	3 Ci Total	Sealed Sources	
E.	Cs-137	5 Ci Total	Sealed Sources	

F.	Pm-147	2 Ci Total	Sealed Sources	
G.	Pu-238	900 mg	Sealed Sources	

Authorized use location is Alcoa Center, PA  
 Gauges and analytical devices may also be used at Alcoa facilities throughout non-Agreement States.

Amendment 30 to 37-07653-02 10 Feb 1974 – leak testing frequency correction.

Amendment 31 to 37-07653-02 23 Jun 1976 – Added:

Item	Isotope	Qty	Form	Notes
H.	Am-241	250 mCi	Sealed Sources	For use in gauges and analytical devices for process control and sample analysis.

Amendment 32 to 37-07653-02 18 Feb 1977 – Amended possession limit for item H to no single source to exceed 1 Ci, 3Ci total.

Amendment 33 to 37-07653-02 6 Jun 1977 – Added:

Item	Isotope	Qty	Form	Notes
I.	Fe-55	100 mCi	Sealed Source Amersham/Searle Model X-133 (IEC 137)	For use in Weston Xact Ray 5320 source holder for thickness meas.

Amendment 34 to 37-07653-02 17 Nov 1977 – Added:

Item	Isotope	Qty	Form	Notes
J.	Ni-63	2 sources 15 mCi	Plated Source Hewlett-Packard Model 18713- 60520 detector cell	For use in Hewlett- Packard gas chromatograph

Amendment 35 to 37-07653-02 6 Oct 1978- Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Byproduct Material 1-83	2 Ci ea 5 Ci total	Any	
B.	H-3	20 Ci	Any	
C.	Cs-137	No source to exceed 500 mCi	Sealed Source Texas Nuclear 570- 57157C	To be used in Texas Nuclear 5191 Source holder for level measurement
D.	Cs-137	No source to exceed 20 mCi	Sealed Source Texas Nuclear 570- 57157C Sealed Source	To be used in Texas Nuclear 5192 Source holder for level measurement
E.	Cs-137	No source to exceed 100 mCi	Sealed Source New England Nuclear NER570	To be used in Kay-Ray Model 7062P Source holders for level measurement

F.	Ni-63	No source to exceed 15 mCi	Plated sources in Hewlett-Packard Model 18713-60520 detector cells.	For use in HP Model 5830A gas chromatographs for sample analysis.
G.	H-3	No source to exceed 1 Ci	Plated sources in Analog Technology Corp. Model 140 detector cells.	For use in Carle Model 111H gas chromatographs for sample analysis.
H.	H-3	No source to exceed 200 mCi	Plated sources in AID Model 510-600 electron capture detector cells.	For use in AID Model 511 gas chromatographs for sample analysis.
I.	Kr-85	No source to exceed 500 mCi	Sealed Source Tracerlab S-76a	For use in Tracerlab HUB-76A source holder for thickness measurement.
J.	Co-60	No source to exceed 100 mCi	Sealed Source Instruments, Inc Model B-20-14	To be used in Instruments, Inc. Model B-20-06 source holder for level determination
K.	Cs-137/Am-241	No source to exceed 10mCi of Cs-137 and 50 mCi of Am-241	Troxler Model A-100280 Sealed Sources	For use in Troxler 2401 soil testing gauges.
L	Cs-137	No source to exceed 2 Ci	Sealed Source Amersham-Searle Model 850233, 3M Type 4P6M or 4P6E	Nuclear-Chicago Model 5120 density gauge.
M.	Sr-90	No source to exceed 300 mCi	Sealed Source U.S. Radium Model LAB 370-1	Ohmart Model LBG-2 source holder For Thickness Gauging
N.	Cs-137	Ohmart Corp. Model A-2102 sealed source	No source to exceed 100 mCi	Ohmart Model ED-6 source holder for density measurement
O.	Cs-137	Ohmart Corp. Model A-2102 sealed source	No source to exceed 300 mCi	Ohmart Model HM-8 source holder for density measurement
P.	Cs-137	No source to exceed 4 Ci	Sealed Source Texas Nuclear 570-57157C	To be used in Texas Nuclear 5176 source holder for density or level

				measurement
Authorized use location is Alcoa Technical Center, Alcoa Center, PA and Alcoa Research Laboratory, New Kensington, PA. See license application dated February 27, 1978; amended July 21, 1978 and August 31, 1978.				

Amendment 36 to 37-07653-02 13 Jun 1980 – Added:

Item	Isotope	Qty	Form	Notes
Q.	Ni-63	No source to exceed 15 mCi	Foil Source Perkin-Elmer Model 330-0119 detector cells	For use in gas chromatograph

Amendment 37 to 37-07653-02 1 Oct 1981 – Added:

Item	Isotope	Qty	Form	Notes
R.	Kr-85	Not to exceed 100 mCi per source	FIFE Model KAC/4 sealed source	For use in FIFE Series 8500, Type NS601 source holder for thickness measurements

Amendment 38 to 37-07653-02 10 Mar 1982 – Added:

Item	Isotope	Qty	Form	Notes
R.	Cs-137	Not to exceed 6 mCi per source	Sealed source Troxler A-100602	For use in Troxler 2376 source holders for density measurements

Amendment 39 to 37-07653-02 28 Dec 1983 – Added:

Item	Isotope	Qty	Form	Notes
S.	Cs-137	Not to exceed 1 Ci per source	Sealed Source Texas Nuclear 57157C	To be used in Texas Nuclear 5203 source holder for density measurements

Amendment 40 to 37-07653-02 14 Feb 1984- Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Ni-63	No source to exceed 15 mCi	Plated sources in Hewlett-Packard Model 18713-60520 detector cells.	For use in gas chromatographs for sample analysis.
B.	H-3	Not to exceed 200 mCi/foil	Foil source contained in AID Model 510-600 detector cell	For use in gas chromatographs for sample analysis.
C.	Kr-85	Not to exceed 100 mCi per source	FIFE Model KAC/4 sealed source	For use in FIFE Series 8500, Type NS601 source holder for thickness measurements
D.	Cs-137	Not to exceed 10 mCi of Cs-137	Troxler Model A-100280 Sealed Sources	For use in Troxler 2401 soil testing gauges.

E.	Am-241	Not to exceed 50 mCi of Am-241	Troxler Model A-100280 Sealed Sources	For use in Troxler 2401 soil testing gauges.
F.	Cs-137	Not to exceed 10 mCi of Cs-137	Campbell Pacific Nuclear Corp. Model 131	For use in Campbell Pacific Nuclear Corp. Model MC-1-122s soil testing gauges.
G.	Am-241	Not to exceed 50 mCi of Am-241	Campbell Pacific Nuclear Corp. Model 131	For use in Campbell Pacific Nuclear Corp. Model MC-1-122s soil testing gauges.
H.	Cs-137	Not to exceed 1 Ci per source	Sealed Source Texas Nuclear 57157C	To be used in Texas Nuclear 5203 source holder for density measurements

Authorized use locations:

- Subitems A., B., C., and H. only to be used at Alcoa Technical Center and Alcoa Research Lab., New Kensington, PA
- Subitems D., E., F., and G. may be used at Alcoa Technical Center, Alcoa Center, PA and Alcoa Research Laboratory, New Kensington, PA and at temporary jobsites throughout the U.S.

Note: No use of unsealed material

See letters dated 12 Sep 1983, (a copy is in amend 41 pkg) 23 Sep 1983, 11 Nov 1983, and 17 Jan 1984.

Amendment 41 to 37-07653-02 12 Jun 1986- Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Ni-63	No source to exceed 15 mCi	Plated sources in Hewlett-Packard Model 18713-60520 or Perkin-Elmer Model 330-0119 detector cells.	For use in gas chromatographs for sample analysis.
B.	H-3	Not to exceed 200 mCi/foil	Foil source contained in AID Model 510-600 detector cell	For use in gas chromatographs for sample analysis.
C.	Kr-85	Not to exceed 100 mCi per source	FIFE Model KAC/4 sealed source	For use in FIFE Series 8500, Type NS601 source holder for thickness measurements
D.	Cs-137	Not to exceed 1 Ci per source	Sealed Source Texas Nuclear 57157C	To be used in Texas Nuclear 5203 source holder for density measurements

Authorized use location is Alcoa Technical Center, Alcoa Center, PA and Alcoa Research Laboratory, New Kensington, PA.

Amendment 42 to 37-07653-02 17 Mar 1988 – RSO change.

Amendment 43 to 37-07653-02 4 May 1988- Rewrite

Item	Isotope	Qty	Form	Notes
A.	Cs-137		Sealed Sources	For possession and use in Kay-Ray, Accuray, Ohmart, LFE, or Texas Nuclear Devices
B.	Ni-63	No source to exceed 15 mCi	Plated sources in Hewlett-Packard Model 18713-60520 or Perkin-Elmer Model 330-0119 detector cells.	For use in gas chromatographs for sample analysis.
C.	H-3	Not to exceed 200 mCi/foil	Foil source contained in AID Model 510-6007 detector cell	For use in gas chromatographs for sample analysis.
D.	Kr-85	Not to exceed 100 mCi per source	FIFE Model KAC/4 sealed source	For use in FIFE Series 8500, Type NS601 source holder for thickness measurements

Authorized use location is Alcoa Technical Center, Alcoa Center, PA and Alcoa Research Laboratory, New Kensington, PA.

Amendment 44 to 37-07653-02 12 Sep 1989 – Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Cs-137		Sealed Sources	For possession and use in Kay-Ray, Accuray, Ohmart, LFE, or Texas Nuclear Devices
B.	Ni-63	No source to exceed 15 mCi	Plated sources in Hewlett-Packard Model 18713-60520 or Perkin-Elmer Model 330-0119 detector cells.	For use in gas chromatographs for sample analysis.
C.	H-3	Not to exceed 200 mCi/foil	Foil source contained in AID Model 510-6007 detector cell	For use in gas chromatographs for sample analysis.
D.	Pm-147	Not to exceed 500 mCi per source, 1,500 mCi total	Sealed source Amersham Model PHC.C1	For use in FAG Bearing Corp. Series FH46 gauge source holder 9850 for density measurements.

Authorized use location is Alcoa Technical Center, Alcoa Center, PA and Alcoa Research Laboratory, New Kensington, PA.

Amendment 45 to 37-07653-02 21 Nov 1990 – Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Cs-137	Not to exceed 8 Ci total	Sealed Sources	For possession and use in Kay-Ray, Accuray, Ohmart, LFE, or Texas Nuclear Devices
B.	Ni-63	No source to exceed 15 mCi per foil, 150 mCi total	Plated sources in Hewlett-Packard Model 18713-60520 or Perkin-Elmer Model 330-0119 detector cells.	For use in gas chromatographs for sample analysis.
C.	H-3	Not to exceed 200 mCi per foil, 2 Ci total	Foil source contained in AID Model 510-6007 detector cell	For use in gas chromatographs for sample analysis.
D.	Pm-147	Not to exceed 500 mCi per source, 1,500 mCi total	Sealed source Amersham Model PHC.C1	For use in FAG Bearing Corp. Series FH46 gauge source holder 9850 for density measurements.
E.	Sr-90	Not to exceed 300 mCi per source and 900 mCi total	Sealed source Accuray Model S-18	For use in Accuray Model U-6 thickness gauge

Authorized use location is Alcoa Technical Center, Alcoa Center, PA and Alcoa Research Laboratory, New Kensington, PA.

Amendment 46 to 37-07653-02 23 Aug 1991 – Change in authorized users

Amendment 47 to 37-07653-02 19 Dec 1994 – Renewal/Rewrite

Item	Isotope	Qty	Form	Notes
A.	Cs-137	Not to exceed 8 Ci total	Sealed Sources	For possession and use in Kay-Ray, Accuray, Ohmart, LFE, Data Measurement Corp., Berthold System, Flow Measurements Systems, Ronan Engineering or Texas Nuclear Devices
B.	Ni-63	No source to exceed 15 mCi per foil, 150 mCi total	Plated sources in Hewlett-Packard Model 18713-60520 or Perkin-Elmer Model 330-0119 detector cells.	For use in gas chromatographs for sample analysis.
C.	H-3	Not to exceed 200 mCi per foil, 2 Ci total	Foil source contained in AID Model 510-6007 detector cell	For use in gas chromatographs for sample

				analysis.
D.	Pm-147	Not to exceed 500 mCi per source, 1,500 mCi total	Sealed source Amersham Model PHC.C1	For use in FAG Bearing Corp. Series FH46 gauge source holder 9850 for density measurements.
E.	Sr-90	Not to exceed 300 mCi per source and 900 mCi total	Sealed source Accuray Model S-18	For use in Accuray Model U-6 thickness gauge

Authorized use location is Alcoa Technical Center, Alcoa Center, PA and Alcoa Research Laboratory, New Kensington, PA.

Amendment 48 to 37-07653-02 23 July 1997 – RSO change, Expiration extension

Amendment 49 to 37-07653-02 28 Sep 2000 – RSO change

Amendment 50 to 37-07653-02 23 Aug 2003 – RSO Change, Add item F.

Item	Isotope	Qty	Form	Notes
A.	Cs-137	Not to exceed 8 Ci total	Sealed Sources	For possession and use in Kay-Ray, Accuray, Ohmart, LFE, Berthold System, Flow Measurements Systems, Ronan Engineering or Texas Nuclear Devices
B.	Ni-63	No source to exceed 15 mCi per foil, 150 mCi total	Plated sources in Hewlett-Packard Model 18713-60520 or Perkin-Elmer Model 330-0119 detector cells.	For use in gas chromatographs for sample analysis.
C.	H-3	Not to exceed 200 mCi per foil, 2 Ci total	Foil source contained in AID Model 510-6007 detector cell	For use in gas chromatographs for sample analysis.
D.	Pm-147	Not to exceed 500 mCi per source, 1,500 mCi total	Sealed source Amersham Model PHC.C1	For use in FAG Bearing Corp. Series FH46 gauge source holder 9850 for density measurements.
E.	Sr-90	Not to exceed 300 mCi per source and 900 mCi total	Sealed source Accuray Model S-18	For use in Accuray Model U-6 thickness gauge
F.	Tl-204	Not to exceed 150 uCi per source, 500 uCi total	Sealed sources Isotope Products Model TCB-I and Helmut Fischer Models C07.XX.XX series	For use in Fischerscope Beta Model 2045 gauge for thickness measurements.

**Appendix E**

**ARL Building 44 Mezzanine Laboratory Photographs**

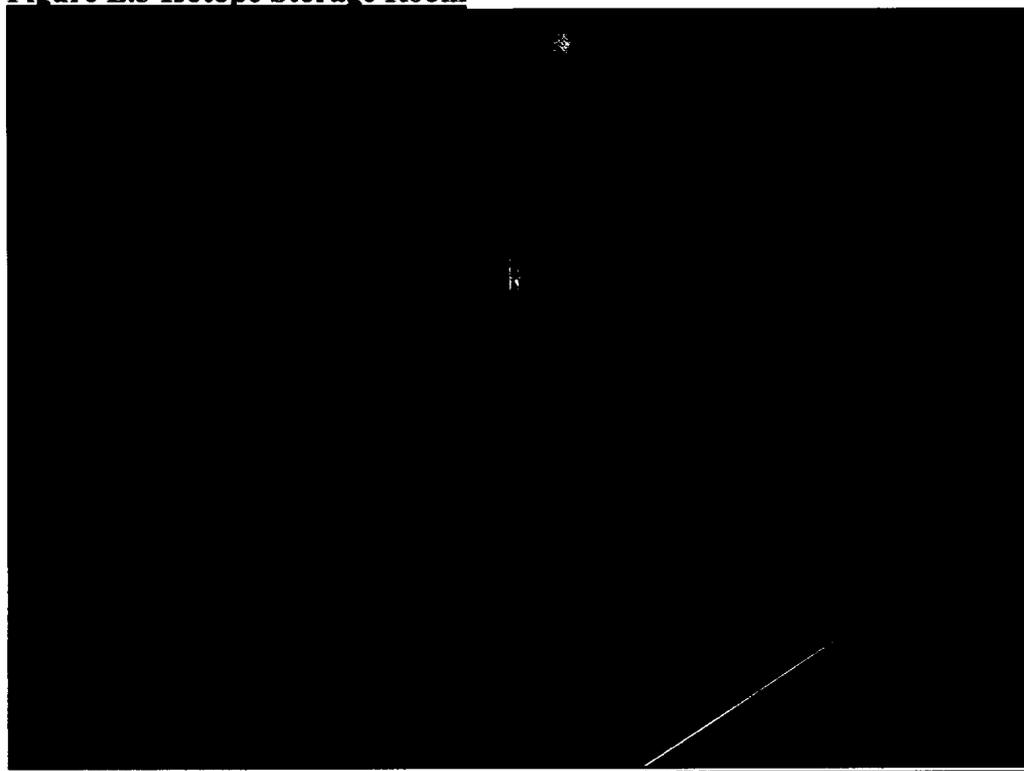
**Figure E.1 High Level Chem Lab**



**Figure E.2 Metallographic Prep Room**



**Figure E.3 Isotope Storage Room**



**Figure E.4 Isotope Storage Room**



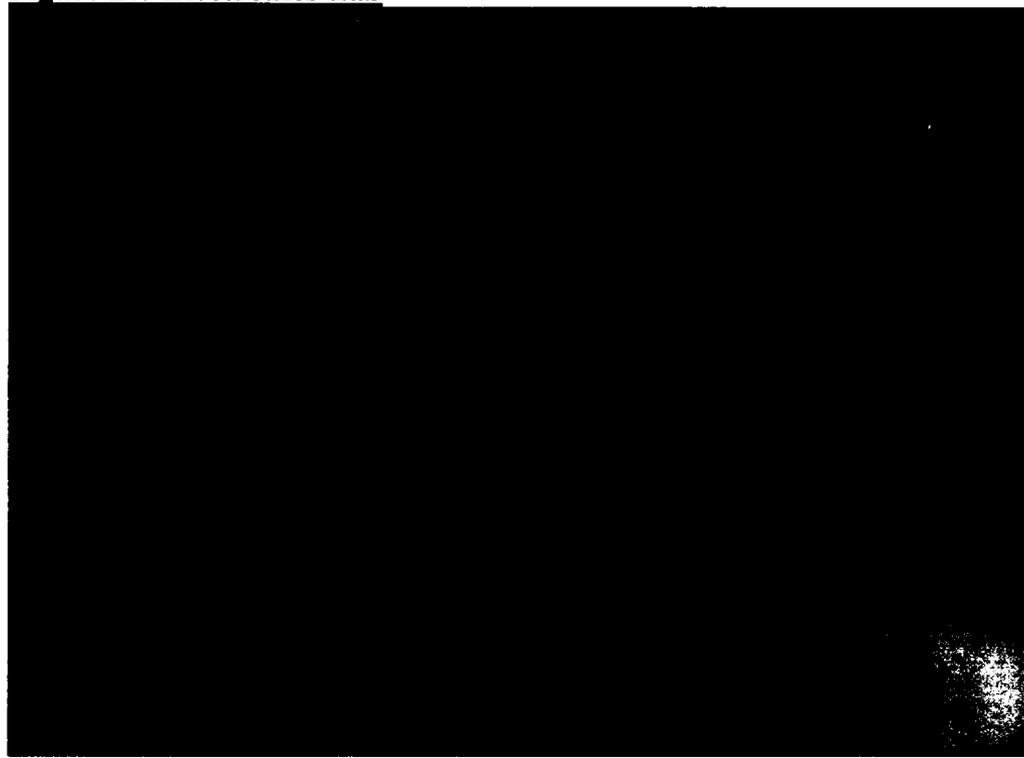
**Figure E.5 Low Level Chem Lab**



**Figure E.6 Low-Level Chem Lab**



**Figure E.7 Electronics Lab**



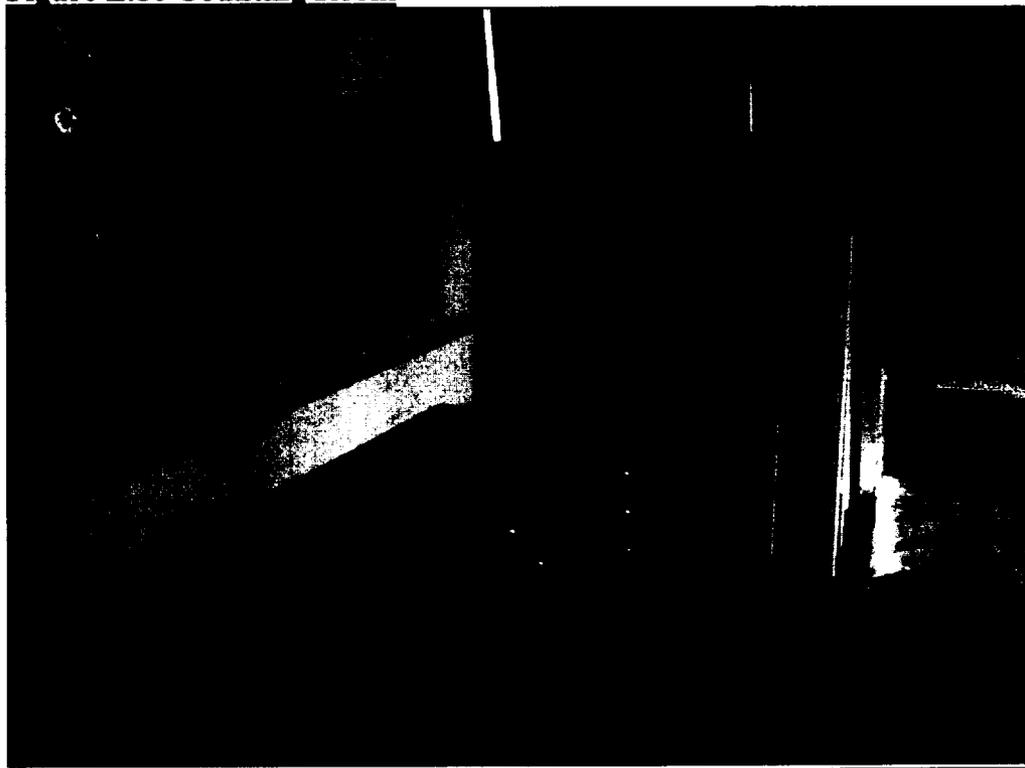
**Figure E.8 Electronics Lab**



**Figure E.9 Electronics Lab**



**Figure E.10 Counting Room**



**Figure E.11 Counting Room**



**Appendix F**

**Survey Instrument Calibration Records**



# CALIBRATION CERTIFICATE

Duratek Instrument Services  
 8 Gallaher Road  
 Kingston, TN 37763  
 Phone: (865) 376-8337  
 Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		INSTRUMENT INFORMATION	
Customer Name: Philotechnics		Manufacturer: Bicon	
Address: 118 Mitchell Road Oak Ridge, TN. 37830		Model: micro rem	AFFTRESX Serial Number: 01731
Contact Name: Dave Culp		Probe: N/A	Serial Number: N/A
Customer Purchase Order Number: TN 04-0316	Work Order Number: 2004-01557	Calibration Method: Electronic and Source	

### INSTRUMENT CALIBRATION INFORMATION

Instrument Range	Calibration Standard Value $\mu\text{R/hr}$	Instrument Response		Comments	
		Before Calibration	After Calibration	Calibration performed in accordance with OEM Technical Manual.	
		$\mu\text{R/hr}$	$\mu\text{R/hr}$	DVM: 6565015	Cal Due: 10/14/04
**X 0.1**	4.0 (Pulsed)	4.0	4.0	D-814: 2525	Cal Due: 10/22/04
**X 0.1**	16 (Pulsed)	16	16	Pulser: 683	Cal Due: 03/12/05
**X 1**	40 (Pulsed)	40	40	Psychron: 7480	Cal Due: 02/10/05
X 1	160	160	160		
X 10	400	400	400	BAT: SAT	Mech Zero: SAT
X 10	1,000	1,000	1,000	HV ok: SAT	Geotropism: SAT
X 10	1,600	1,600	1,600	Reset: SAT	
X 100	4,000	4,000	4,000	**X0.1** Range Pulser Calibrated	
X 100	10,000	10,000	10,000	Temp: 22.0°C	
X 100	16,000	16,000	16,000	Pressure: 745mmHg	
X1000	40,000	40,000	40,000	Humidity: 35%	
X1000	100,000	100,000	100,000	Source: Cs <sup>137</sup> 049711 Cert Date: 04/09/04 Cs <sup>137</sup> 019701 Cert Date: 07/15/03 Cs <sup>137</sup> 019702 Cert Date: 04/08/04	
X1000	160,000	160,000	160,000		

### STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).

Instrument		
Calibrated By:	Reviewed By:	Date: 5-7-04
Calibration Date: 05/07/04	Calibration Due: 05/07/05	

atek Instrument Services  
 628 Gallaher Road  
 Kingston, TN 37763  
 Phone: (865) 376-8337  
 Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				INSTRUMENT INFORMATION	
Customer Name: Philotechnics Ltd.				Manufacturer: NE Technology	
Address: 118 Mitchell Road Oak Ridge, TN 37830				Model: Selectra1A	Serial Number: 459
Contact Name: Dave Culp				Probe: IDP6DD	Serial Number: K163
Contract Purchase Order Number: TN 03-0920		Work Order Number: 2004-01465		Calibration Method: Electronic and Source	
INSTRUMENT CALIBRATION INFORMATION					
Instrument Range (Auto Ranging)	Calibration Standard Value (cpm)	Instrument Response (cpm)		Comments	
		Before Calibration	After Calibration		
0-1K	200	200	200	Pulser: 101500	Cal Due: 09/18/04
0-1K	500	499	499	D-814: 2525	Cal Due: 10/22/04
0-1K	800	800	800	Psychron: 7480	Cal Due: 02/10/05
1K-10K	2,000	2,000	2,000		
1K-10K	5,000	5,011	5,011	Temp: 21.6°C	Humidity: 38%
1K-10K	8,000	8,000	8,000	Pressure: 739mmHg	
10K-100K	20,000	20,000	20,000		
10K-100K	50,000	50,100	50,100	Audio: SAT	Linearity Test: SAT
10K-100K	80,000	80,300	80,300	Batt. Check: SAT	Overrange: SAT
100K-1M	200,000	202,000	202,000	Backlight: SAT	
100K-1M	500,000	513,000	513,000		
100K-1M	800,000	837,000	837,000	Calibrated in accordance with OEM Technical Manual and Industry applicable standards	
All readings within $\pm 10\%$ of Standard Values					
METER CALIBRATION TESTS				COMMENTS	
Test 1 – Software Version	8	Test 5,6,7 Dac Tests	SAT	See detector calibration sheet for detector specific information.	
Test 2 – Keypad Test	SAT	Test 8 – Calibrate HV	SAT		
Test 3 – Display Test	SAT	Test 9 – HV Error Check	SAT		
Test 4 – Option Switches	SAT				
STATEMENT OF CERTIFICATION					
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).					
Instrument					
Calibrated By: <i>M. Paul</i>		Reviewed By: <i>Albert D. Smith</i>		Date: <i>4-1-04</i>	
Calibration Date: 04/01/04			Calibration Due: 04/01/05		



# CALIBRATION CERTIFICATE

Duratek Instrument Services  
628 Gallaher Road  
Kingston, TN 37763  
Phone: (865) 376-8337  
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				DETECTOR INFORMATION			
Customer Name: Philotechnics Ltd.				Manufacturer: NE Technology			
Address: 118 Mitchell Road Oak Ridge, TN 37830				Model: IDP6DD		Serial Number: K163	
Contact Name: Dave Culp				Calibration Method: Electronic and Source			
Contract Purchase Order Number: TN 03-0920		Work Order Number: 2004-01465					
DETECTOR PARAMETER SETUPS							
Parameter	As Found	As Left	Parameter	As Found	As Left	Comments	
0	4.2	4.2	8	unit CPM	unit CPM	Pulser: 101500	Cal Due: 09/18/04
1	Off	Off	A	On	On	D-814: 2525	Cal Due: 10/22/04
3	940V	940V	b	Off	Off	Psychron: 7480	Cal Due: 02/10/05
4	3.00uA	3.00uA	c	Auto	Auto		
5	3uS	3uS	E	dual	dual	Temp: 21.6°C	Humidity: 38%
6	1.50V	1.50V	F	566	566	Pressure: 739mmHg	
7	60s	60s	h	163	163	** Parameters are loaded into the Selectra instrument automatically when smart detector is connected. **	
INSTRUMENT INFORMATION							
<u>Model</u>			<u>Serial Number</u>			<u>Calibration Due Date</u>	
Selectra 1A			459			04/01/05	
USED FOR EFFICIENCY DETERMINATION AND HV PLATEAUIING							
EFFICIENCY DETERMINATION							
Isotope/Serial #	Source Counts CPM		Background CPM		Efficiency in % (Determined on contact)		
Th <sup>230</sup> #119706 21,240DPM	2,566		3		12.1%		
Tc <sup>99</sup> #069604 21,840DPM	2,515		241		10.4%		
C <sup>14</sup> #019708 26,820DPM	644		241		1.5%		
STATEMENT OF CERTIFICATION							
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).							
Instrument							
Calibrated By: <i>M. Paul</i>		Reviewed By: <i>James G. Smith</i>			Date: <i>4-5-04</i>		
Calibration Date: 04/01/04				Calibration Due: 04/01/05			



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CUSTOMER INFORMATION		INSTRUMENT INFORMATION	
Customer Name: Philotechnics, Ltd.		Manufacturer: Ludlum	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: 2221	Serial Number: 68535
Contact Name: Pam Thomas		Probe: N/A	Serial Number: N/A
Customer Purchase Order Number: TN 04-0316	Work Order Number: 2004-01742	Calibration Method: Electronic	

**INSTRUMENT CALIBRATION INFORMATION**

Instrument Range	Calibration Standard Value CPM	Ratemeter Response		Calibration Standard Value CPM	Time Base (min)	Tolerances (cpm) ± 10%	Scaler Response	
		As Found	As Left				As Found	As Left
X 1	100	100	100	1,000 CPM	.1	90 - 110	100	100
X 1	250	250	250	1,000 CPM	.2	180 - 220	199	199
X 1	400	400	400	1,000 CPM	.5	450 - 550	497	497
X 10	1,000	1,000	1,000	1,000 CPM	1	900 - 1,100	995	995
X 10	2,500	2,500	2,500	1,000 CPM	2	1.8K-2.2K	1,990	1,990
X 10	4,000	4,000	4,000	1,000 CPM	5	4.5K-5.5K	4,976	4,976
X 100	10,000	10,000	10,000					
X 100	25,000	25,000	25,000					
X 100	40,000	40,000	40,000					
X 1000	100,000	100,000	100,000					
X 1000	250,000	250,000	250,000					
X 1000	400,000	400,000	400,000					

**STATEMENT OF CERTIFICATION**

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).

Instrument			
Calibrated By: M. Pauli	Reviewed By: 	Date: 6/16/04	
Calibration Date: 06/15/04	Calibration Due: 06/15/05		

Model: 2221Serial Number: 68535

M&TE					Environmental Conditions				
Volt Meter	Due Date:	03/08/05	ID	TW12662	Barometer	Due Date:	10/22/04	ID:	2525
Pulser	Due Date:	09/18/04	ID	101500	Thermometer	Due Date:	10/22/04	ID:	2525
Timer	Due Date:	10/23/04	ID	22226011	Temp: 22.7 °C	Pressure: 743mmHg	Humidity: 68%		
INSTRUMENT CALIBRATION INFORMATION									
Special Test									
Geotropism	Sat (√) Unsat ( )			Hold	Sat (√) Unsat ( )				
BAT > 4.5	Sat (√) Unsat ( )			Volume Test	Sat (√) Unsat ( )				
Mechanical Zero	Sat (√) Unsat ( )			Audio Divide	Sat (√) Unsat ( )				
Digital Zero	Sat (√) Unsat ( )			Window Switch	Sat (√) Unsat ( )				
Count	Sat (√) Unsat ( )			Lamp	Sat (√) Unsat ( )				
High Voltage Calibration									
Voltage	Tolerance ± 2%			As Found	As Left				
400	392-408			402	402				
1,000	980-1,020			1,007	1,007				
1,500	1,470-1,530			1,513	1,513				
1,900	1,862-1,932			1,914	1,914				
Threshold/Gain Calibration (Desired Ratio <u>10</u> mV/100)									
<u>Input</u>	<u>As Found Value</u>		<u>As Found Ratio (mV/100)</u>		<u>As Left Value</u>		<u>As Left Ratio (mV/100)</u>		
10	103		9.7		103		9.7		
20	214		9.3		214		9.3		
30	326		9.2		326		9.2		
40	432		9.3		432		9.3		
Logmeter Scale Linearity Check									
<u>Input</u>	<u>±20% Tolerance</u>		<u>As Found</u>		<u>As Left</u>				
LOG	400		320-480		400		400		
LOG	4,000		3,200-4,800		4,000		4,000		
LOG	40,000		32,000-48,000		45,000		45,000		
LOG	400,000		320,000-480,000		400,000		400,000		
COMMENTS									
Calibrated in accordance with IN-WI-237 Rev 0									
Instrument									
Calibrated By: <u>Mike Paul</u>					Reviewed By: <u>[Signature]</u> Date: <u>6/15/04</u>				
Calibration Date: 06/15/04					Calibration Due: 06/15/05				



**DETECTOR  
CERTIFICATE**

Duratek Instrument Services  
Gallaher Road  
Kingston, TN 37763  
Phone: (865) 376-8337  
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				DETECTOR INFORMATION		
Customer Name: Philotechnics				Manufacturer: Ludlum		
Address: 118 Mitchell Road Oak Ridge, TN 37830				Detector Model: 43-68A		
Contact Name: Pam Thomas				Serial Number: 129324		
Customer Purchase Order Number: TN 04-0316		Work Order Number: 2004-01742		Evaluation Method: Source		
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION						
1) Source Nuclide: Th <sup>230</sup>		Serial Number: 119739		Activity (dpm): 18,600		Certification Date: 10/2097
Parameter	As Found	As Left	Precision Test		CPM (Source #1)	
Count 1	3,887	3,887	Count 1(Heel)		3,588	
Count 2	3,917	3,917	Count 2(Center)		3,982	
Count 3	3,807	3,807	Count 3(Toe)		3,749	
Average	3,870	3,870	Average		3,773	
Background (cpm)	1.8	1.8	Tolerance		All counts within ±10% of Average	
Net Counts	3,869	3,869	Pass/Fail		PASS	
Efficiency	20.8%	20.8%				
Low Sample Activity: Source #: N/A		High Sample Activity: Source #: N/A		Dead Time (DT): N/A	Calibration Constant (CC): N/A	
SCALER INFORMATION			DETECTOR INFORMATION			
Model	Serial Number		Due Date	Background (cpm)	Operating Voltage	Threshold
2221	68535		06/15/05	1.8	1200V	40 = 4mV
Detector Setup Report	YES	NO ✓	Barcode Report	YES	NO ✓	Voltage Plateau YES ✓ NO
COMMENTS						
**Calibrated with 5Ft. Cable**			Calibrated in accordance with IN-WI-239 Rev 0			
10 minute background			Efficiency determined w/43-68 source jig			
STATEMENT OF CERTIFICATION						
We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).						
Detector		Certified By: M. Paul		Reviewed By: <i>[Signature]</i>		Date: 6/16/04
Calibration Date: 06/15/04				Certification Due: 06/15/05		

BACKGROUND PLATEAU 43-68#129324 5FT CABLE 6/15/04

900	0
950	0
1000	0
1050	2
1100	0
1150	1
1200	1
1250	1
1300	3
1350	1
1400	1
1450	6
1500	22
1550	48
1600	85
1650	143
1700	222
1750	288
1800	281
1850	315
1900	316
1950	357

ALPHA PLATEAU TH-230#119739 18,600DPM

900	0
950	1
1000	7
1050	1183
1100	2859
1150	3723
1200	3782
1250	3756
1300	3959
1350	4003
1400	3905
1450	4099
1500	4470

BETA PLATEAU TC-99#119715 21,900DPM

1400	24
1450	335
1500	1180
1550	2269
1600	3474
1650	4627
1700	5505
1750	5876
1800	5838
1850	6019
1900	6385
1950	6649



**DETECTOR  
CERTIFICATE**

Duratek Instrument Services  
Gallaher Road  
Kingston, TN 37763  
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Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				DETECTOR INFORMATION			
Customer Name: Philotechnics				Manufacturer: Ludlum			
Address: 118 Mitchell Road Oak Ridge, TN 37830				Detector Model: 43-68B			
Contact Name: Pam Thomas				Serial Number: 129324			
Customer Purchase Order Number: TN 04-0316		Work Order Number: 2004-01742		Evaluation Method: Source			
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION							
1) Source Nuclide: Tc <sup>99</sup>		Serial Number: 119715		Activity (dpm): 21,900		Certification Date: 10/14/97	
Parameter	As Found	As Left	Precision Test		CPM (Source #1)		
Count 1	6,371	6,371	Count 1(Heel)		5,930		
Count 2	6,273	6,273	Count 2(Center)		6,345		
Count 3	6,459	6,459	Count 3(Toe)		6,216		
Average	6,368	6,368	Average		6,164		
Background (cpm)	303.4	303.4	Tolerance		All counts within ±10% of Average		
Net Counts	6,065	6,065	Pass/Fail		PASS		
Efficiency	27.7%	27.7%					
Low Sample Activity: Source #: N/A		High Sample Activity: Source #: N/A		Dead Time (DT): N/A		Calibration Constant (CC): N/A	
SCALER INFORMATION			DETECTOR INFORMATION				
Model	Serial Number		Due Date	Background (cpm)	Operating Voltage	Threshold	
2221	68535		06/15/05	303.4	1800V	40 = 4mV	
Detector Setup Report		YES	NO ✓	Barcode Report		YES	NO ✓
<b>COMMENTS</b>							
**Calibrated with 5Ft. Cable**			Calibrated in accordance with IN-WI-239 Rev 0.				
10 minute background			Efficiency determined w/43-68 source jig				
STATEMENT OF CERTIFICATION							
We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).							
Detector		Certified By: <i>M. Paul</i>		Reviewed By: <i>[Signature]</i>		Date: 6/16/04	
Calibration Date: 06/15/04				Certification Due: 06/15/05			

BACKGROUND PLATEAU 43-68#129324 5FT CABLE 6/15/04

900	0
950	0
1000	0
1050	2
1100	0
1150	1
1200	1
1250	1
1300	3
1350	1
1400	1
1450	6
1500	22
1550	48
1600	85
1650	143
1700	222
1750	288
1800	281
1850	315
1900	316
1950	357

ALPHA PLATEAU TH-230#119739 18,600DPM

900	0
950	1
1000	7
1050	1183
1100	2859
1150	3723
1200	3782
1250	3756
1300	3959
1350	4003
1400	3905
1450	4099
1500	4470

BETA PLATEAU TC-99#119715 21,900DPM

1400	24
1450	335
1500	1180
1550	2269
1600	3474
1650	4627
1700	5505
1750	5876
1800	5838
1850	6019
1900	6385
1950	6649



**DETECTOR  
CERTIFICATE**

Duratek Instrument Services  
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Kingston, TN 37763  
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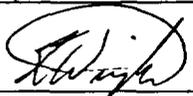
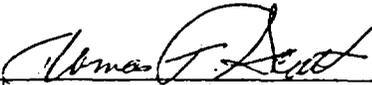
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CUSTOMER INFORMATION				DETECTOR INFORMATION		
Customer Name: Philotechnics				Manufacturer: Ludlum		
Address: 118 Mitchell Road Oak Ridge, TN 37830				Detector Model: 43-68B		
Contact Name: Pam Thomas				Serial Number: 129324		
Customer Purchase Order Number: TN 04-0316		Work Order Number: 2004-01742		Evaluation Method: Source		
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION						
1) Source Nuclide: C <sup>14</sup>		Serial Number: 019708		Activity (dpm): 26,045		Certification Date: 11/20/96
Parameter	As Found	As Left	Precision Test		CPM (Source #1)	
Count 1	4,548	4,548	Count 1(Heel)		3,739	
Count 2	4,532	4,532	Count 2(Center)		4,441	
Count 3	4,566	4,566	Count 3(Toe)		4,117	
Average	4,549	4,549	Average		4,099	
Background (cpm)	303.4	303.4	Tolerance		All counts within ±10% of Average	
Net Counts	4,245	4,245	Pass/Fail		PASS	
Efficiency	16.3%	16.3%				
Low Sample Activity: Source #: N/A		High Sample Activity: Source #: N/A		Dead Time (DT): N/A		Calibration Constant (CC): N/A
SCALER INFORMATION			DETECTOR INFORMATION			
Model	Serial Number		Due Date	Background (cpm)	Operating Voltage	Threshold
2221	68535		06/15/05	303.4	1800V	40 = 4mV
Detector Setup Report	YES	NO ✓	Barcode Report	YES	NO ✓	Voltage Plateau YES ✓ NO
COMMENTS						
**Calibrated with 5Ft. Cable**			Calibrated in accordance with IN-WI-239 Rev 0.			
10 minute background			Efficiency determined w/43-68 source jig			
STATEMENT OF CERTIFICATION						
We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).						
Detector						
Certified By: <i>M. Paul</i>		Reviewed By: <i>[Signature]</i>		Date: <i>6/16/04</i>		
Certification Date: 06/15/04				Certification Due: 06/15/05		

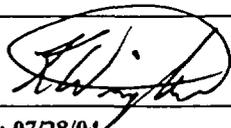


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Fax: (865) 376-8331

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CUSTOMER INFORMATION				INSTRUMENT INFORMATION				
Customer Name: Duratek Instrument Services				Manufacturer: Ludlum				
Address: 628 Gallaher Road, Kingston, TN 37763				Model: 2221	Serial Number: 117370			
Contact Name: Tom Scott				Probe: N/A	Serial Number: N/A			
Customer Purchase Order Number: N/A		Work Order Number: 2004-01945		Calibration Method: Electronic				
INSTRUMENT CALIBRATION INFORMATION								
Instrument Range	Calibration Standard Value CPM	Ratemeter Response		Calibration Standard Value CPM	Time Base (min)	Tolerances (cpm) ± 10%	Scaler Response	
		As Found	As Left				As Found	As Left
X 1	100	100	100	1,000 CPM	.1	90 - 110	100	100
X 1	250	250	250	1,000 CPM	.2	180 - 220	201	201
X 1	400	400	400	1,000 CPM	.5	450 - 550	501	501
X 10	1,000	1,000	1,000	1,000 CPM	1	900 - 1,100	1,002	1,002
X 10	2,500	2,500	2,500	1,000 CPM	2	1.8K-2.2K	2,010	2,010
X 10	4,000	4,000	4,000	1,000 CPM	5	4.5K-5.5K	5,013	5,013
X 100	10,000	10,000	10,000					
X 100	25,000	25,000	25,000					
X 100	40,000	40,000	40,000					
X 1000	100,000	100,000	100,000					
X 1000	250,000	250,000	250,000					
X 1000	400,000	400,000	400,000					
STATEMENT OF CERTIFICATION								
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).								
Instrument			Calibrated By: 			Reviewed By: 		
			Date: 7-29-04					
Calibration Date: 07/28/04				Calibration Due: 01/28/05				

Model: 2221Serial Number: 117370

M&TE					Environmental Conditions				
Volt Meter	Due Date:	03/08/05	ID	TW12662	D-814	Due Date:	10/22/04	ID:	2525
Pulser	Due Date:	03/08/05	ID	112860	Psychron	Due Date:	02/10/05	ID:	7480
Timer	Due Date:	03/04/05	ID	02080601	Temp: 23.7 °C	Pressure: 742mmHg	Humidity: 49%		
INSTRUMENT CALIBRATION INFORMATION									
Special Test									
Geotropism		Sat ( ✓ ) Unsat ( )			Hold		Sat ( ✓ ) Unsat ( )		
BAT > 4.5		Sat ( ✓ ) Unsat ( )			Volume Test		Sat ( ✓ ) Unsat ( )		
Mechanical Zero		Sat ( ✓ ) Unsat ( )			Audio Divide		Sat ( ✓ ) Unsat ( )		
Digital Zero		Sat ( ✓ ) Unsat ( )			Window Switch		Sat ( ✓ ) Unsat ( )		
Count		Sat ( ✓ ) Unsat ( )			Lamp		Sat ( ✓ ) Unsat ( )		
High Voltage Calibration									
Voltage	Tolerance ± 2%				As Found		As Left		
400	392-408				392		400		
1,000	980-1,020				976		1000		
1,500	1,470-1,530				1467		1500		
1,900	1,862-1,932				1856		1900		
Threshold/Gain Calibration (Desired Ratio <u>10</u> mV/100)									
<u>Input</u>	<u>As Found Value</u>		<u>As Found Ratio (mV/100)</u>		<u>As Left Value</u>		<u>As Left Ratio (mV/100)</u>		
10	100		10.0		100		10.0		
20	212		10.6		195		9.75		
30	320		10.7		304		10.13		
40	429		10.73		406		10.15		
Logmeter Scale Linearity Check									
<u>Input</u>		<u>±20% Tolerance</u>			<u>As Found</u>		<u>As Left</u>		
LOG		400			320-480		400		400
LOG		4,000			3,200-4,800		4,000		4,000
LOG		40,000			32,000-48,000		40,000		40,000
LOG		400,000			320,000-480,000		400,000		400,000
COMMENTS									
Instrument									
Calibrated By: 					Reviewed By: 				
Calibration Date: 07/28/04					Date: 7-28-04				
					Calibration Due: 01/28/05				



**CALIBRATION  
CERTIFICATE**

Duratek Instrument Services  
628 Gallaher Road  
Kingston, TN 37763  
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Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				DETECTOR INFORMATION	
Customer Name: Duratek Instrument Services				Manufacturer: Ludlum	
Address: 628 Gallaher Rd Kingston, TN 37763				Detector Model: 43-37A	
Contact Name: Thomas Scott				Serial Number: 120106	
Customer Purchase Order Number: N/A		Work Order Number: 2004-01618		Evaluation Method: Source	
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION					
Source Nuclide: Th <sup>230</sup>		Serial Number: 119706		Activity (dpm): 21,240	
				Certification Date: 10/14/97	
Parameter	As Found	As Left	Precision Test		CPM
Count 1	2,492	2,492	Count 1 (Heel)		2,462
Count 2	2,562	2,562	Count 2 (Center)		2,246
Count 3	2,259	2,259	Count 3 (Toe)		2,141
Count 4	2,293	2,293	Average		2,283
Count 5	2,046	2,046	Tolerance		±10%
Count 6	2,239	2,239	Pass/Fail		Pass
Average	2,315	2,315			
Background (CPM)	9.8	9.8			
Net Counts	2,305	2,305			
Efficiency	10.9%	10.9%			
Low Sample Activity: Source #: N/A		High Sample Activity: Source #: N/A		Dead Time (DT): N/A	Calibration Constant (CC): N/A
SCALER INFORMATION			DETECTOR INFORMATION		
Model	Serial Number	Due Date	Background (cpm)	Operating Voltage	Threshold
2360	185777	10/28/04	9.8	1700V	120mV
Detector Setup Report		YES NO ✓	Barcode Report		YES NO ✓
			Voltage Plateau		YES ✓ NO
COMMENTS					
10 minute background performed			Efficiency performed on contact with 5ft. cable		
STATEMENT OF CERTIFICATION					
We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).					
Certified By: Mike Paul		Reviewed By: <i>Thomas G. Scott</i>		Date: 4-29-04	
Certification Date: 04/29/04			Certification Due: 10/29/04		



**CALIBRATION  
CERTIFICATE**

Duratek Instrument Services  
628 Gallaher Road  
Kingston, TN 37763  
Phone: (865) 376-8337  
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION				DETECTOR INFORMATION	
Customer Name: Duratek Instrument Services				Manufacturer: Ludlum	
Address: 628 Gallaher Rd Kingston, TN 37763				Detector Model: 43-37B	
Contact Name: Thomas Scott				Serial Number: 120106	
Customer Purchase Order Number: N/A		Work Order Number: 2004-01618		Evaluation Method: Source	
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION					
Source Nuclide: Tc <sup>99</sup>		Serial Number: 019418		Activity (dpm): 23,465	
Certification Date: 10/01/92					
Parameter	As Found	As Left	Precision Test		CPM
Count 1	4,714	4,714	Count 1 (Heel)		4,790
Count 2	4,837	4,837	Count 2 (Center)		4,499
Count 3	4,693	4,693	Count 3 (Toe)		4,765
Count 4	4,713	4,713	Average		4,685
Count 5	4,574	4,574	Tolerance		±10%
Count 6	4,629	4,629	Pass/Fail		Pass
Average	4,693	4,693			
Background (CPM)	597.2	597.2			
Net Counts	4,096	4,096			
Efficiency	17.5%	17.5%			
Low Sample Activity: Source #: N/A		High Sample Activity: Source #: N/A		Dead Time (DT): N/A	Calibration Constant (CC): N/A
SCALER INFORMATION			DETECTOR INFORMATION		
Model	Serial Number	Due Date	Background (cpm)	Operating Voltage	Threshold
2360	185777	10/28/04	597.2	1700V	3.5-30mV
Detector Setup Report		YES NO ✓	Barcode Report		YES NO ✓
			Voltage Plateau		YES ✓ NO
COMMENTS					
10 minute background performed			Efficiency performed on contact with 5ft. cable		
STATEMENT OF CERTIFICATION					
We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).					
Certified By: <i>Mike Paul</i>		Reviewed By: <i>Thomas G. Scott</i>		Date: <i>4-29-04</i>	
Certification Date: 04/29/04			Certification Due: 10/29/04		

Detector 43-37 #120106 Raw Data (Counts)										
Voltage	Background		Pu-239		Tc-99		N/A		N/A	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
1550	4	128	852	225	6	1971				
1575	4	200	1203	323	4	2545				
1600	6	265	1381	327	4	2826				
1625	9	356	1649	448	6	3389				
1650	7	432	1896	530	10	4197				
1675	6	578	2102	708	6	4609				
1700	8	667	2232	771	7	4865				
1725	10	858	2397	943	13	4759				
1750	7	994	2588	1157	13	4533				

Source Info		Nuclide Pu-239		Tc-99		N/A		N/A	
ID	19442				19418				
Initial DPM	13613				23465				
Certification Date	6/1/1992				10/1/1992				
Today's Date	4/28/2004				4/28/2004		4/28/2004		4/28/2004
Source Age (Years)	11.91				11.57		104.33		104.33
Half-Life (Years)	2.41E+04				2.13E+05				
Corrected Activity	13608				23464		#DIV/0!		#DIV/0!

Net CPM													
Voltage	MDA/Cross-Talk			Beta Eff. (%)	Alpha Eff. (%)	Pu-239		Tc-99		N/A		N/A	
	Beta MDA	Alpha MDA	Beta-Alpha			Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
1550	704.7	192.8	0.3%	7.85%	6.2%	848	97	2	1843	-4	-128	-4	-128
1575	685.5	136.4	0.2%	9.99%	8.8%	1199	123	0	2345	-4	-200	-4	-200
1600	718.8	139.6	0.1%	10.91%	10.1%	1375	62	-2	2561	-6	-265	-6	-265
1625	700.1	138.3	0.2%	12.93%	12.1%	1640	92	-3	3033	-9	-356	-9	-356
1650	619.6	108.2	0.2%	16.05%	13.9%	1889	98	3	3765	-7	-432	-7	-432
1675	666.9	91.6	0.1%	17.18%	15.4%	2096	130	0	4031	-6	-578	-6	-578
1700	686.8	97.1	0.1%	17.89%	16.3%	2224	104	-1	4198	-8	-667	-8	-667
1725	836.1	99.3	0.3%	16.63%	17.5%	2387	85	3	3901	-10	-858	-10	-858
1750	990.6	79.2	0.3%	15.08%	19.0%	2581	163	6	3539	-7	-994	-7	-994

*Thomas G. Scott*

4-28-04



**CALIBRATION  
CERTIFICATE**

ek Instrument Services  
 28 Gallaher Road  
 Kingston, TN 37763  
 Phone: (865) 376-8337  
 Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION			INSTRUMENT INFORMATION		
Customer Name: Philotechnics Ltd.			Manufacturer: Ludlum		
Address: 118 Mitchell Road Oak Ridge, TN 37830			Model: 2929	Serial Number: 196231	
Contact Name: Dave Culp			Probe: 43-10-1	Serial Number: 203053	
Contract Purchase Order Number: TN 03-0920		Work Order Number: 2004-01484	Calibration Method: Electronic And Source		
INSTRUMENT CALIBRATION INFORMATION					
M&TE	ID Number	Calibration Due Date	Environmental Conditions		
Thermometer	2525	10/22/04	Temperature	23.5°C	
Barometer	2525	10/22/04	Pressure	748mmHg	
Hygrometer	7480	02/10/05	Humidity	44%	
Pulse Generator	120935	03/28/04	Calibrated in accordance with IN-WI-235		
DVM	6565015	10/14/04			
Isotope	Source ID Number	Original Activity (dpm)	Source Cert. Date	Decayed Activity (dpm)	
Th <sup>230</sup>	119739	18,600	10/20/97	18,600	
Tc <sup>99</sup>	069605	25,200	06/20/96	25,200	
Pu <sup>239</sup>	019442	13,613	06/01/92	13,613	
FREQUENCY CALIBRATION					
Desired (cpm)	Tolerances (cpm)	Alpha As Found (cpm)	Alpha As Left (cpm)	Beta As Found (cpm)	Beta As Left (cpm)
4	4	4	4	4	4
40	40	40	40	40	40
400	(392-408)	401	401	401	401
4,000	(3,920-4,080)	4,004	4,004	4,004	4,004
40,000	(39.2K-40.8K)	40,031	40,031	40,051	40,051
400,000	(392K-408K)	400,313	400,313	400,326	400,326
Background Determination		Alpha As Found	Alpha As Left	Beta As Found	Beta As Left
Counts, C <sub>b</sub>		5	5	1,018	1,018
Time, T <sub>b</sub> (min)		20	20	20	20
Rate, R <sub>b</sub> (cpm)		.25	.25	50.9	50.9
STATEMENT OF CALIBRATION					
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).					
Instrument		Reviewed By: <i>James F. Scott</i>		Date: 3-11-04	
ated By: <i>Dave Culp</i>		Calibration Date: 03/11/04		Calibration Due: 03/11/05	

SS TALK & HIGH VOLTAGE SHEET

Instrument ID: 196231

<b>As Found Alpha Threshold (mv)</b>		<b>As Left Alpha Threshold (mv)</b>			
175		175			
<b>Alpha Source: Cross Talk – Performed using Pu<sup>239</sup> 019442</b>					
<b>Paramter and Tolerance</b>	<b>Alpha As Found</b>	<b>Alpha As Left</b>	<b>Beta As Found</b>	<b>Beta As Left</b>	
Source Count, C <sub>i</sub>	27,065	27,065	1,091	1,091	
Time, T <sub>i</sub> (min)	5	5	5	5	
Rate, R <sub>i</sub> (cpm)	R <sub>s[α]</sub> = 5,413	R <sub>s[α]</sub> = 5,413	R <sub>s[β]</sub> = 203.6	R <sub>s[β]</sub> = 203.6	
% Crosstalk [α to β] ( < 10%)	$\frac{R_{s[\beta]} - R_{b[\beta]}}{R_{s[\alpha]} - R_{b[\alpha]}} = \frac{203.6 - 50.9}{5,413 - 0.25} = 2.8\%$				
<b>As Found Beta Low Threshold</b>	<b>As Left Beta Low Threshold</b>	<b>As Found Beta High Threshold</b>	<b>As Left Beta High Threshold</b>		
4.0mv	4mv	50mv	50mv		
<b>Beta Source: Cross Talk-Performed using Tc<sup>99</sup> 069605</b>					
<b>Paramter and Tolerance</b>	<b>Alpha As Found</b>	<b>Alpha As Left</b>	<b>Beta As Found</b>	<b>Beta As Left</b>	
Source Count, C <sub>i</sub>	5	5	27,213	27,213	
Time, T <sub>i</sub> (min)	5	5	5	5	
Rate, R <sub>i</sub> (cpm)	R <sub>s[α]</sub> = 1	R <sub>s[α]</sub> = 1	R <sub>s[β]</sub> = 5442.6	R <sub>s[β]</sub> = 5442.6	
% Crosstalk [β to α] ( < 1%)	$\frac{R_{s[\alpha]} - R_{b[\alpha]}}{R_{s[\beta]} - R_{b[\beta]}} = \frac{1 - 0.25}{5442.6 - 50.9} = .00014\%$				
<b>HIGH VOLTAGE POWER SUPPLY CALIBRATION</b>					
<b>Desired Voltage</b>	<b>Tolerance</b>	<b>DVM As Found</b>	<b>DVM As Left</b>	<b>2929 Meter As Found</b>	<b>2929 Meter As Left</b>
600	540 – 660	606	606	600	600
800	720 – 880	797	797	800	800
1,000	900 – 1,100	1,004	1,004	1,000	1,000
1,200	1,080 – 1,320	1,201	1,201	1,200	1,200
1,300	1,170 – 1,430	1,312	1,312	1,300	1,300
<b>High Voltage</b>		<b>As Found</b>	<b>Vern Dial Reading</b>	<b>As Left</b>	<b>HV Vern Dial Reading</b>
		738V	3.00	738V	3.00
<b>STATEMENT OF CERTIFICATION</b>					
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).					
<b>Instrument</b>					
Calibrated By: <i>[Signature]</i>		Reviewed By: <i>[Signature]</i>		Date: <i>3-11-04</i>	
Calibration Date: 03/11/04			Calibration Due: 03/11/05		

EFFICIENCY SHEET

Instrument ID: 196231

As Found Alpha Threshold (mv)		As Left Alpha Threshold (mv)		
190		175		
<b>Alpha Source: Efficiency determined using Th<sup>230</sup> #119739</b>				
Parameter and Tolerance	Alpha As Found	Alpha As Left	Beta As Found	Beta As Left
Source Count, C <sub>s</sub>	31,988	31,988	N/A	N/A
Time, T <sub>s</sub> (min)	5	5	5	5
Rate, R <sub>s</sub> (cpm)	R <sub>s(α)}</sub> = 6,397.6	R <sub>s(α)}</sub> = 6,397.6	R <sub>s(β)}</sub> = N/A	R <sub>s(β)}</sub> = N/A
EFF (% c/d) (≥25%)	34.4%	34.4%	N/A	N/A
As Found Beta Low Threshold	As Left Beta Low Threshold	As Found Beta High Threshold	As Left Beta High Threshold	
4.6mv	4mv	50mv	50mv	
<b>Beta Source: Efficiency determined using Tc<sup>99</sup> #069605</b>				
Parameter and Tolerance	Alpha As Found	Alpha As Left	Beta As Found	Beta As Left
Source Count, C <sub>s</sub>	N/A	N/A	27,213	27,213
Time, T <sub>s</sub> (min)	5	5	5	5
Rate, R <sub>s</sub> (cpm)	R <sub>s(α)}</sub> = N/A	R <sub>s(α)}</sub> = N/A	R <sub>s(β)}</sub> = 5,442.6	R <sub>s(β)}</sub> = 5,442.6
EFF (% c/d) (≥10%)	N/A	N/A	21.4%	21.4%
<b>COMMENTS</b>				
<b>STATEMENT OF CERTIFICATION</b>				
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).				
Instrument				
Calibrated By: <i>[Signature]</i>	Reviewed By: <i>[Signature]</i>	Date: 3-11-04		
Calibration Date: 03/11/04		Calibration Due: 03/11/05		

Instrument ID: 196231

**Source and Background Plateau Worksheet**

High Voltage	Background		Alpha Source Pu <sup>239</sup>		Beta Source Tc <sup>99</sup>		Cross Talk %		
	Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	β to α	
600									
625									
650									
675									
700	No voltage plateau performed. All efficiencies and crosstalk in tolerance.								
725									
750									
775									
800									
825									
850									
875									
900									
925									
950									
975									
1000									

**Statement of Certification**

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).

Instrument

Calibrated By:



Reviewed By:

Date:

Calibration Date: 03/11/04

Calibration Due: 03/11/05

**Appendix G**

**Offsite Laboratory Sample Analytical Results**



**TELEDYNE  
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company  
2508 Quality Lane  
Knoxville, TN 37931-3133

Philotechnics  
Attn: Art Palmer  
P.O. Box 4489  
Oak Ridge TN 37831-4489

**Report of Analysis/Certificate of Conformance**

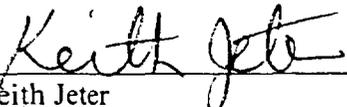
8/27/04

LIMS #: L24057  
Project ID#: PH001-3EREG-04  
Received: 8/6/04  
Delivery Date: 9/5/04  
P.O. #: 0000096  
Release #:  
SDG #: N/A

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

  
\_\_\_\_\_  
Keith Jeter  
Operations Manager

*Cross Reference Table*

Client ID	Laboratory ID	Station ID (if applicable)
ALCOA 1	L24057-1	
ALCOA 2	L24057-2	
ALCOA 3	L24057-3	
ALCOA 4	L24057-4	

# Report of Analysis

8/27/04 2:48:41PM

L24057

Philotechnics

PH001-3EREG-04



Art Palmer

Sample ID/Station: ALCOA 1	Collect Start: 08/04/04 14:00	Matrix: Solids (SD)
LIMS Number: L24057-1	Collect Stop:	Volume:
Description: Source Stage over lettering	Received: 08/06/04	% Moisture:

Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values		
SAMPLE VOL/MASS			6.24E+001		g									
BE-7	2007	<		2.64E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
K-40	2007	<b>3.84E+000</b>	4.41E-001		pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	+		Yes
CR-51	2007	<		2.71E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
MN-54	2007	<		2.37E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CO-57	2007	<		1.99E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CO-58	2007	<		2.39E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
FE-59	2007	<		5.26E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CO-60	2007	<b>6.30E-002</b>	2.05E-002		pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	+		Yes
ZN-65	2007	<		5.27E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
Y-88	2007	<		2.50E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
NB-94	2007	<		2.28E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
NB-95	2007	<		2.81E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	*		No
ZR-95	2007	<		4.23E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
MO-99	2007	<		7.41E+000	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
RU-103	2007	<		3.05E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
RU-106	2007	<		2.10E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
AG-110M	2007	<		2.43E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
SN-113	2007	<		3.35E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
SB-124	2007	<		2.64E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
SB-125	2007	<		7.19E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
I-131	2007	<		8.81E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CS-134	2007	<		2.26E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CS-136	2007	<		4.95E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CS-137	2007	<b>2.86E+000</b>	5.87E-002		pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	+		Yes
CE-139	2007	<		2.14E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma and peak identified(gamma only)  
 \* = Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

# Report of Analysis

8/27/04 10:48:42PM

**L24057**

Philotechnics

PH001-3EREG-04



Sample ID/Station: <b>ALCOA 1</b>	Collect Start: 08/04/04 14:00	Matrix: Solids (SD)
LIMS Number: L24057-1	Collect Stop:	Volume:
Description: Source Stage over lettering	Received: 08/06/04	% Moisture:

Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values		
BA-140	2007	<		1.76E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
LA-140	2007	<		6.09E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CE-141	2007	<		4.70E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
CE-144	2007	<		1.56E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
EU-152	2007	<		7.07E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
EU-154	2007	<		4.01E-002	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
RA-226	2007	<		5.02E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		Yes
AC-228	2007	4.19E-001	9.11E-002		pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	+		Yes
TH-228	2007	2.21E+000	3.66E-001		pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	+		Yes
TH-232	2007	4.42E-001	6.77E-002		pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	+		Yes
U-235	2007	<		1.52E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		Yes
U-238	2007	<		2.78E+000	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No
AM-241	2007	<		1.24E-001	pCi/g Dry	62.380	g dry	08/04/04 14:00	08/19/04	60,000	Seconds	U		No

**Comments:**

Sample ID/Station: <b>ALCOA 2</b>	Collect Start: 08/04/04 14:30	Matrix: Solids (SD)
LIMS Number: L24057-2	Collect Stop:	Volume:
Description: Source Stage bottom	Received: 08/06/04	% Moisture:

Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values		
SAMPLE VOL/MASS			7.33E+001		g									
BE-7	2007	<		2.87E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U		No
K-40	2007	3.93E+000	5.61E-001		pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	+		Yes
CR-51	2007	<		3.30E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U		No
MN-54	2007	<		3.10E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U		No
CO-57	2007	<		2.35E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U		No

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma and peak identified(gamma only)  
 • = Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**

# Report of Analysis

8/27/04 14:48:42PM

L24057

Philotechnics

PH001-3EREG-04



Sample ID/Station: ALCOA 2			Collect Start: 08/04/04 14:30			Matrix: Solids (SD)							
LIMS Number: L24057-2			Collect Stop:			Volume:							
Description: Source Stage bottom			Received: 08/06/04			% Moisture:							
Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values	
CO-58	2007	<		3.37E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
FE-59	2007	<		7.13E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
CO-60	2007	<		<b>4.26E-002</b>	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	*	No
ZN-65	2007	<		7.14E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
Y-88	2007	<		3.11E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
NB-94	2007	<		3.22E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
NB-95	2007	<		3.96E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
ZR-95	2007	<		6.14E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
MO-99	2007	<		1.05E+001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
RU-103	2007	<		3.83E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
RU-106	2007	<		2.65E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
AG-110M	2007	<		3.15E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
SN-113	2007	<		4.20E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
SB-124	2007	<		3.32E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
SB-125	2007	<		8.67E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
I-131	2007	<		1.07E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
CS-134	2007	<		2.75E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
CS-136	2007	<		6.55E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
CS-137	2007	<b>1.22E+000</b>	5.36E-002		pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	+	Yes
CE-139	2007	<		2.51E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
BA-140	2007	<		2.22E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
LA-140	2007	<		8.22E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
CE-141	2007	<		5.36E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
CE-144	2007	<		1.79E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
EU-152	2007	<		8.47E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No
EU-154	2007	<		4.76E-002	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U	No

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# Report of Analysis

8/27/04 4:48:42PM

L24057

Philotechnics

PH001-3EREG-04



Sample ID/Station: ALCOA 2	Collect Start: 08/04/04 14:30	Matrix: Solids (SD)
LIMS Number: L24057-2	Collect Stop:	Volume:
Description: Source Stage bottom	Received: 08/06/04	% Moisture:

Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values		
RA-226	2007	1.34E+000	5.82E-001		pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	+		Yes
AC-228	2007	4.95E-001	1.42E-001		pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	+		Yes
TH-228	2007	<		7.22E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	*		No
TH-232	2007	5.62E-001	9.42E-002		pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	+		Yes
U-235	2007	<		1.80E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U		No
U-238	2007	<		3.80E+000	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U		No
AM-241	2007	<		2.25E-001	pCi/g Dry	73.250	g dry	08/04/04 14:30	08/19/04	60,000	Seconds	U		No

Comments:

Sample ID/Station: ALCOA 3	Collect Start: 08/04/04 15:00	Matrix: Solids (SD)
LIMS Number: L24057-3	Collect Stop:	Volume:
Description: Source Stage 13K	Received: 08/06/04	% Moisture:

Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values		
SAMPLE VOL/MASS			1.27E+001		g									
BE-7	2007	<		4.44E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
K-40	2007	<		1.26E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CR-51	2007	<		3.38E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
MN-54	2007	<		6.10E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CO-57	2007	<		1.46E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CO-58	2007	<		7.21E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
FE-59	2007	<		1.42E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CO-60	2007	<		9.60E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
ZN-65	2007	<		1.14E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
Y-88	2007	<		5.36E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
NB-94	2007	<		6.85E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No

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Bolded text indicates reportable value.

# Report of Analysis

8/27/04 11:48:42PM

L24057

Philotechnics

PH001-3EREG-04



Sample ID/Station: ALCOA 3			Collect Start: 08/04/04 15:00			Matrix: Solids (SD)								
LIMS Number: L24057-3			Collect Stop:			Volume:								
Description: Source Stage 13K			Received: 08/06/04			% Moisture:								
Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values		
NB-95	2007	<		3.39E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
ZR-95	2007	<		1.27E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
MO-99	2007	<		1.69E+002	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
RU-103	2007	<		4.52E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
RU-106	2007	<		2.30E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
AG-110M	2007	<		3.33E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
SN-113	2007	<		5.03E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
SB-124	2007	<		2.47E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
SB-125	2007	<		1.19E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
I-131	2007	<		1.15E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CS-134	2007	<		2.06E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CS-136	2007	<		9.93E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CS-137	2007	<b>2.88E+003</b>	2.23E+001		pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	+		Yes
CE-139	2007	<		1.79E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
BA-140	2007	<		2.27E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
LA-140	2007	<		9.95E-001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CE-141	2007	<		3.55E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
CE-144	2007	<		1.16E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
EU-152	2007	<		9.25E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
EU-154	2007	<		2.97E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
RA-226	2007	<		5.05E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
AC-228	2007	<		2.39E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
TH-228	2007	<		4.86E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
TH-232	2007	<		2.38E+000	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
U-235	2007	<		1.20E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No
U-238	2007	<		8.35E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U		No

Flag Values  
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# Report of Analysis

8/27/04 4:48:22PM

L24057

Philotechnics

PH001-3EREG-04



Sample ID/Station: ALCOA 3			Collect Start: 08/04/04 15:00			Matrix: Solids (SD)							
LIMS Number: L24057-3			Collect Stop:			Volume:							
Description: Source Stage 13K			Received: 08/06/04			% Moisture:							
Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values	
AM-241	2007	<		1.10E+001	pCi/g Dry	12.730	g dry	08/04/04 15:00	08/19/04	1,500	Seconds	U	No

Comments:

Sample ID/Station: ALCOA 4			Collect Start: 08/04/04 15:30			Matrix: Solids (SD)							
LIMS Number: L24057-4			Collect Stop:			Volume:							
Description: Source Stage 31 K			Received: 08/06/04			% Moisture:							
Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values	
SAMPLE VOL/MASS			1.62E+001		g								
BE-7	2007	<		6.26E+001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
K-40	2007	<		4.09E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	Yes
CR-51	2007	<		4.89E+001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
MN-54	2007	<		7.44E-001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CO-57	2007	<		2.28E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CO-58	2007	<		8.71E-001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
FE-59	2007	<		1.61E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CO-60	2007	<		8.91E-001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
ZN-65	2007	<		1.54E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
Y-88	2007	<		4.16E-001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
NB-94	2007	<		9.25E-001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
NB-95	2007	<		1.03E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
ZR-95	2007	<		1.86E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
MO-99	2007	<		2.49E+002	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
RU-103	2007	<		6.41E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
RU-106	2007	<		3.03E+001	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
AG-110M	2007	<		4.19E+000	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	*	No

Flag Values  
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MDC - Minimum Detectable Concentration

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# Report of Analysis

8/27/04 11:48:42PM

**L24057**

Philotechnics

PH001-3EREG-04



Sample ID/Station: <b>ALCOA 4</b>	Collect Start: <b>08/04/04 15:30</b>	Matrix: <b>Solids (SD)</b>
LIMS Number: <b>L24057-4</b>	Collect Stop:	Volume:
Description: <b>Source Stage 31 K</b>	Received: <b>08/06/04</b>	% Moisture:

Radionuclide	SOP #	Activity Conc	Uncertainty (2 Sigma)	MDC	Units	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Time Units	Flag Values	
SN-113	2007	<		<b>7.12E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
SB-124	2007	<		<b>3.52E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
SB-125	2007	<		<b>1.67E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
I-131	2007	<		<b>1.68E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CS-134	2007	<		<b>3.01E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CS-136	2007	<		<b>1.33E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CS-137	2007	<b>6.12E+003</b>	<b>3.06E+001</b>		pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	+	Yes
CE-139	2007	<		<b>2.61E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
BA-140	2007	<		<b>3.19E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
LA-140	2007	<		<b>8.00E-001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CE-141	2007	<		<b>5.41E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
CE-144	2007	<		<b>1.80E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
EU-152	2007	<		<b>1.34E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
EU-154	2007	<		<b>4.67E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
RA-226	2007	<		<b>7.19E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
AC-228	2007	<		<b>3.23E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
TH-228	2007	<		<b>6.85E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
TH-232	2007	<		<b>3.21E+000</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
U-235	2007	<		<b>1.78E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
U-238	2007	<		<b>9.02E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No
AM-241	2007	<		<b>2.63E+001</b>	pCi/g Dry	16.160	g dry	08/04/04 15:30	08/19/04	1,500	Seconds	U	No

Comments:

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma and peak identified(gamma only)  
 • = Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**

Philotechnics, Ltd.

P.O. Box 4489 - Oak Ridge, TN 37831-4489

(888) RADWAS 1

L 24057  
P. 20

Exhibit 1  
Page 1 of 1  
Revision No. 1

CHAIN-OF-CUSTODY RECORD

Client Name: <u>PHILOTECHNICS</u> Contact: <u>ART PRINCE</u> Address: <u>118 MITCHELL RD</u> Telephone: <u>865-285-3042</u> City/State/Zip: <u>OAK RIDGE TN 37830</u> Fax: _____ Turn Around: <input type="checkbox"/> Priority <input type="checkbox"/> Rush <input checked="" type="checkbox"/> Normal      Needed By: <u>9/16/04</u> Company (Signature): _____	Project Name: <u>ALCOA - POC</u> Project No.: _____ Send Report To: <u>ART PRINCE</u> Sampler (Signature): <u>[Signature]</u>
--	---

Sample No.	Date	Time	Comp	Grab	Sample Location	Matrix*	Preserved in Field		No. of Containers	Analysis Required		Comments on Samples
							Yes	No		X	X	
ALCOA 1	8/4	14:00			SOURCE STG. OVER LEMING	1		X		X	X	
ALCOA 2	8/4	14:30			SOURCE STG. BAYVIEW LOT	1		X		X	X	
ALCOA 3	8/4	15:00			SOURCE STG. 17K SAMPLE	1		X		X	X	
ALCOA 4	8/4	15:30			SOURCE STG. 31K SAMPLE	1		X		X	X	

Relinquished by (Signature): _____	Date: _____	Time: _____	<b>Lab Use Only</b>
Received by (Signature): _____	Date: _____	Time: _____	Seals Intact Upon Receipt: <input type="checkbox"/> Yes <input type="checkbox"/> No
Relinquished by (Signature): _____	Date: _____	Time: _____	Broken Containers: <input type="checkbox"/> Yes <input type="checkbox"/> No
Received by (Signature): _____	Date: _____	Time: _____	
Relinquished by (Signature): _____	Date: _____	Time: _____	Containers Labeled: <input type="checkbox"/> Yes <input type="checkbox"/> No
Comments: _____			
			Suspected Contamination: <input type="checkbox"/> Yes <input type="checkbox"/> No

\* 1—Soil, 2—Water, 3—Sludge, 4—Urine, 5—Air, 6—Dust, 7—Building Material, 8—Other

**Appendix H**

**Facility Survey Maps**

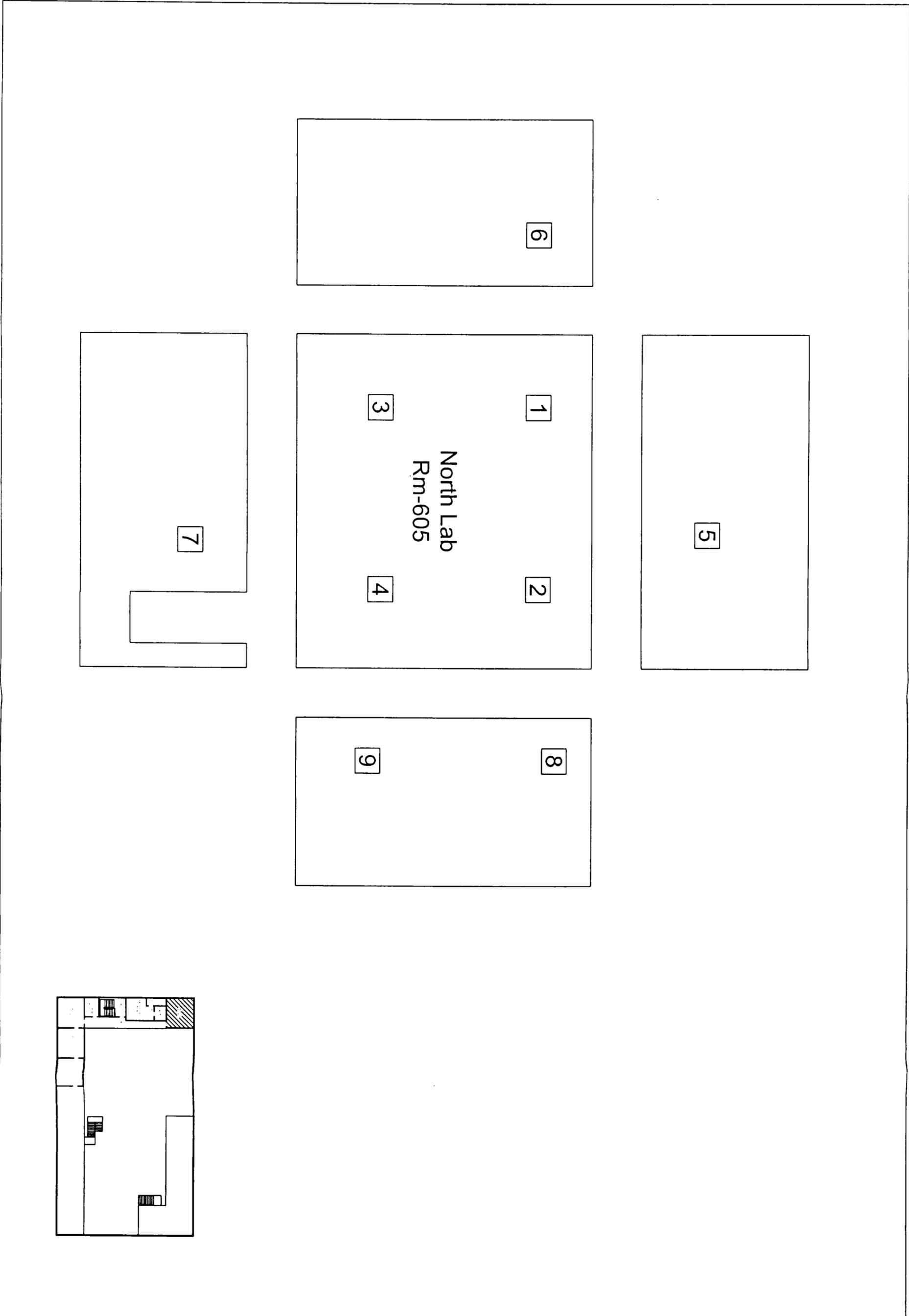


Figure H.2

North Lab Survey Locations

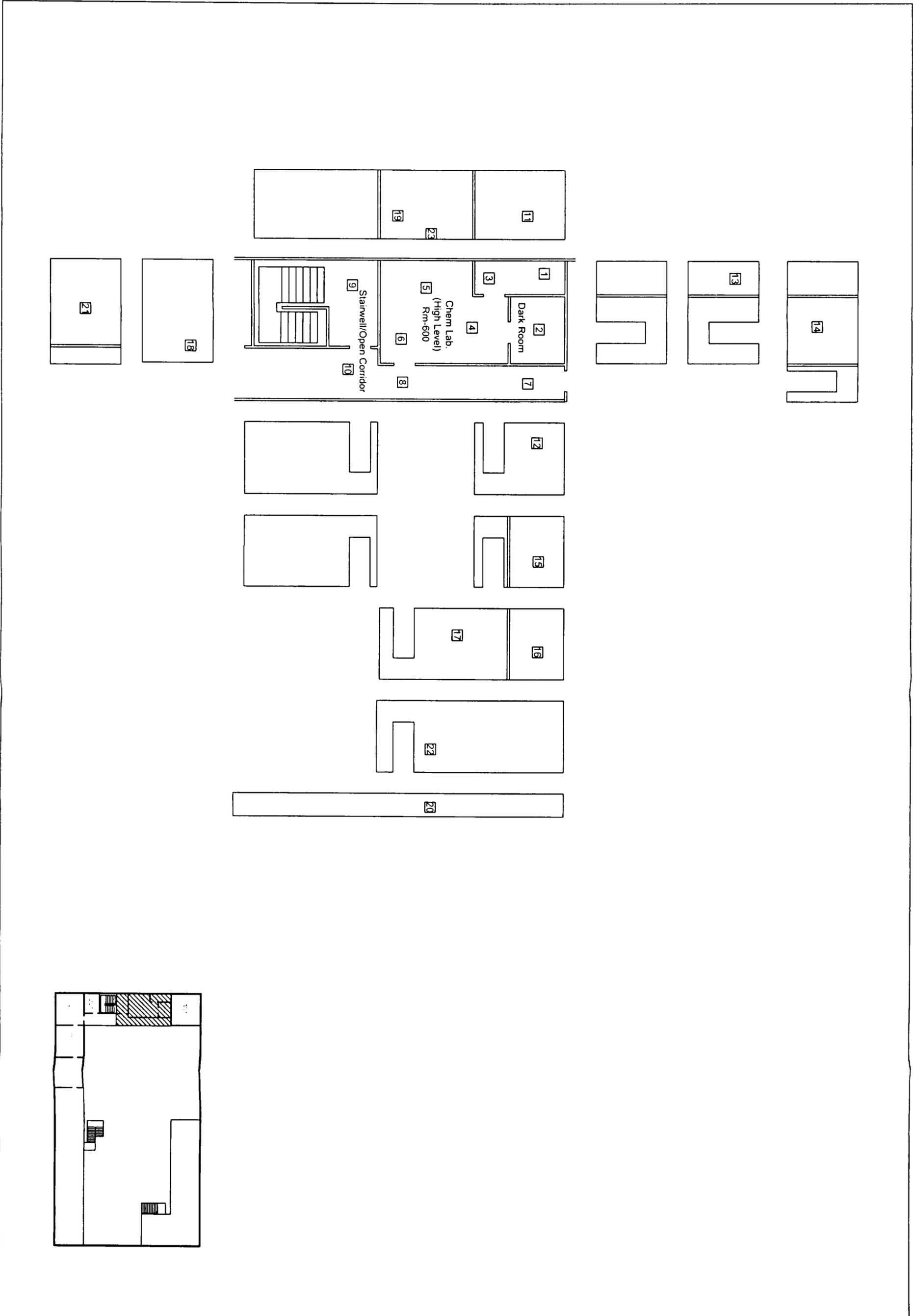


Figure H.3

High Level Chem Lab Survey Locations

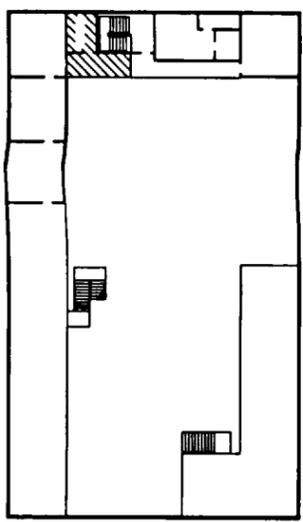
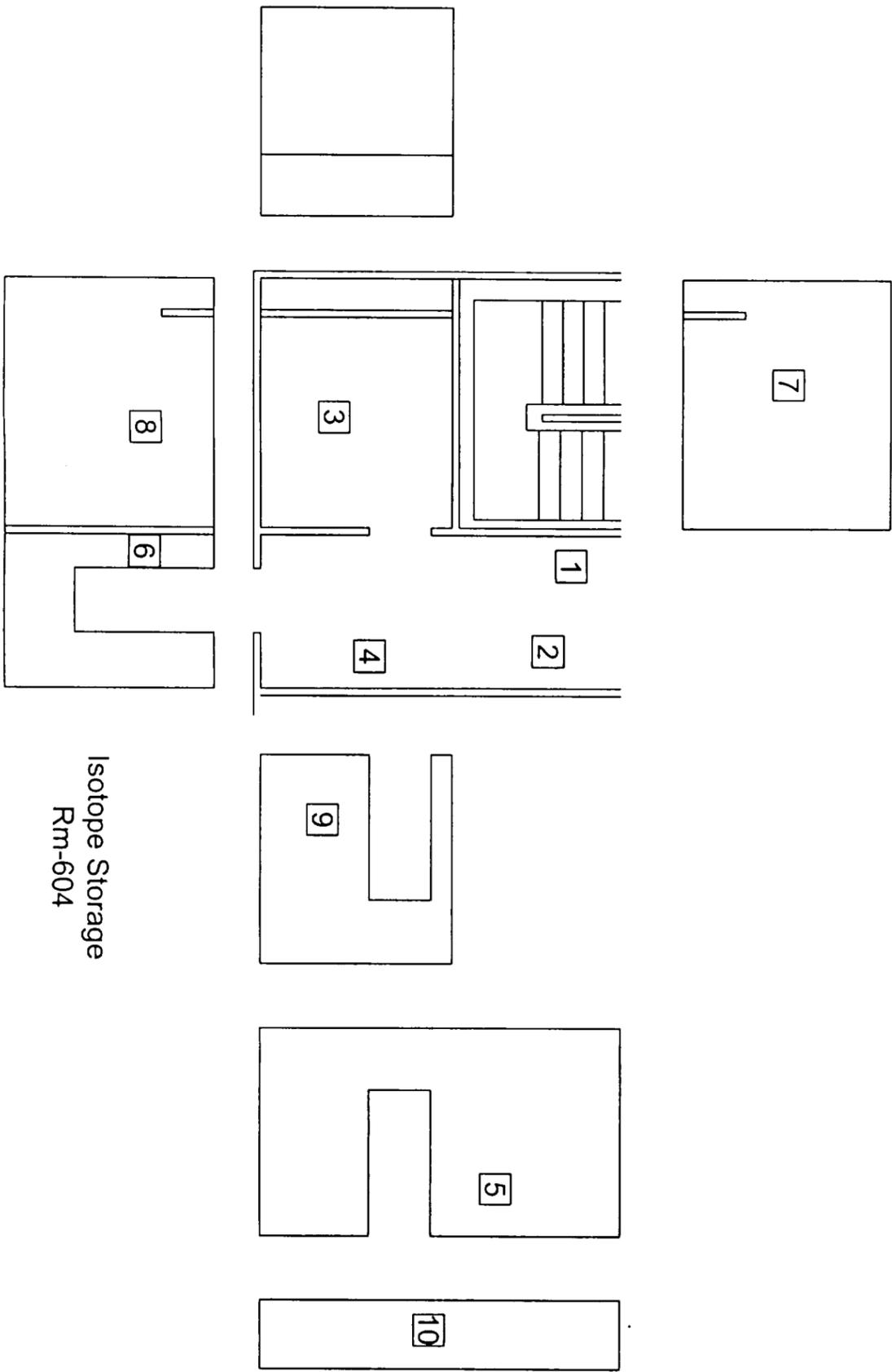
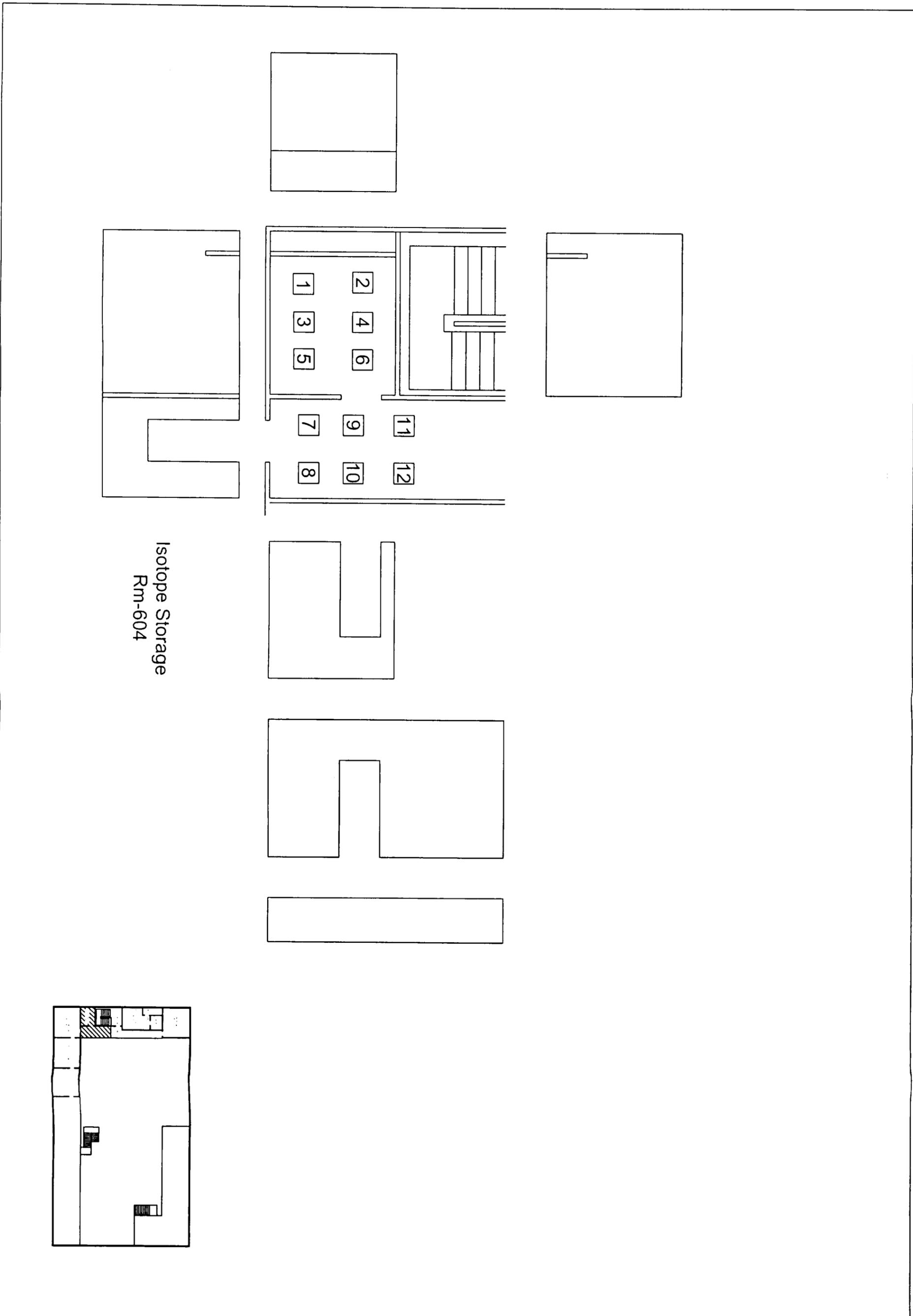


Figure H.4a

Storage Room Initial Survey Locations



Isotope Storage  
Rm-604

Figure H.4b

Storage Room Final Wipe Locations

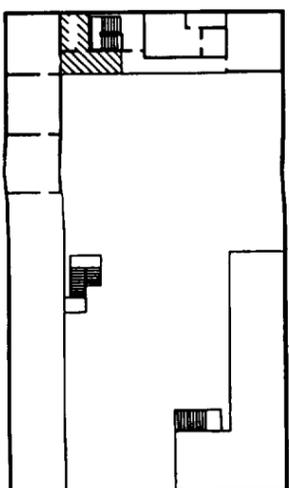
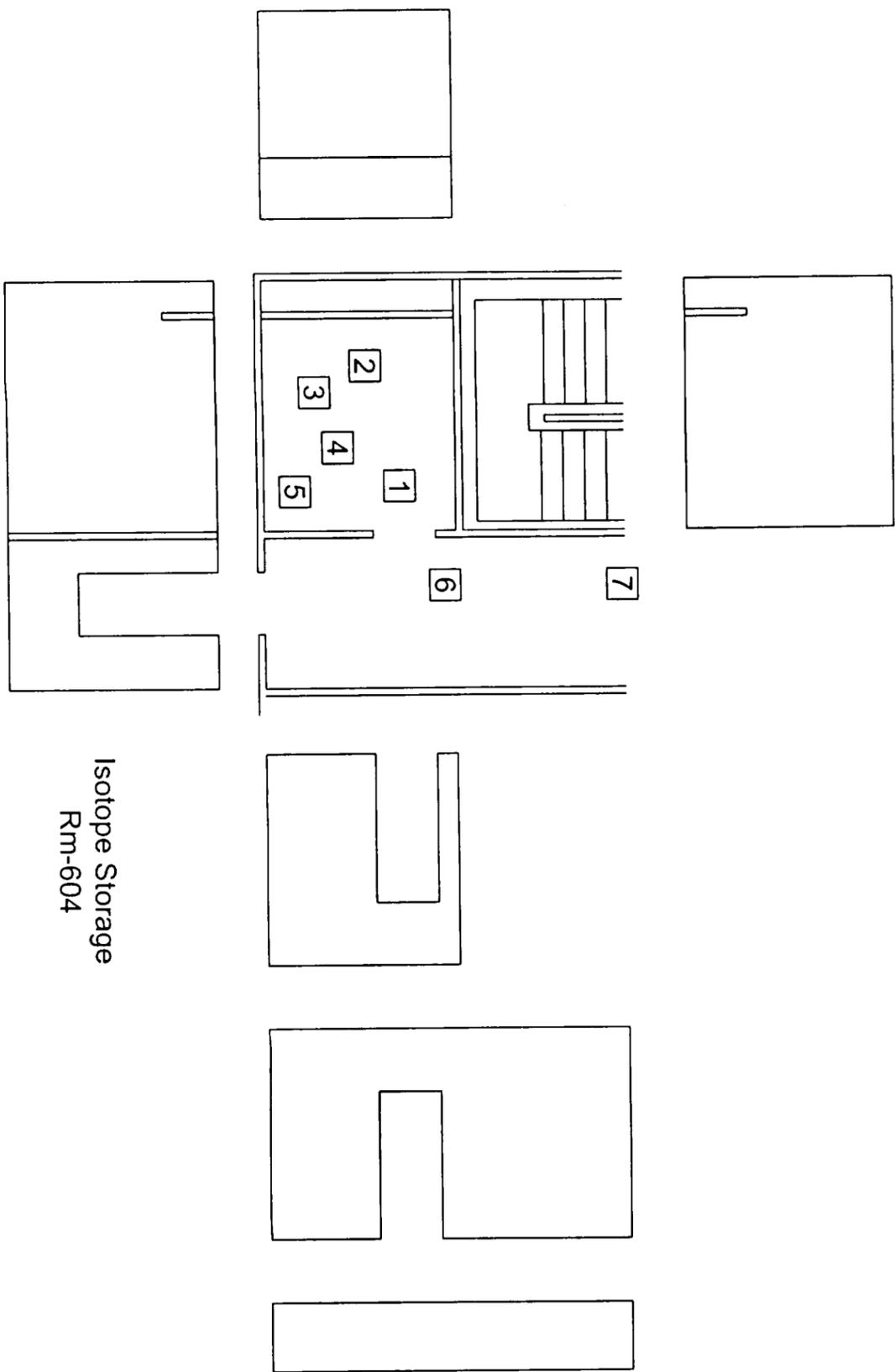
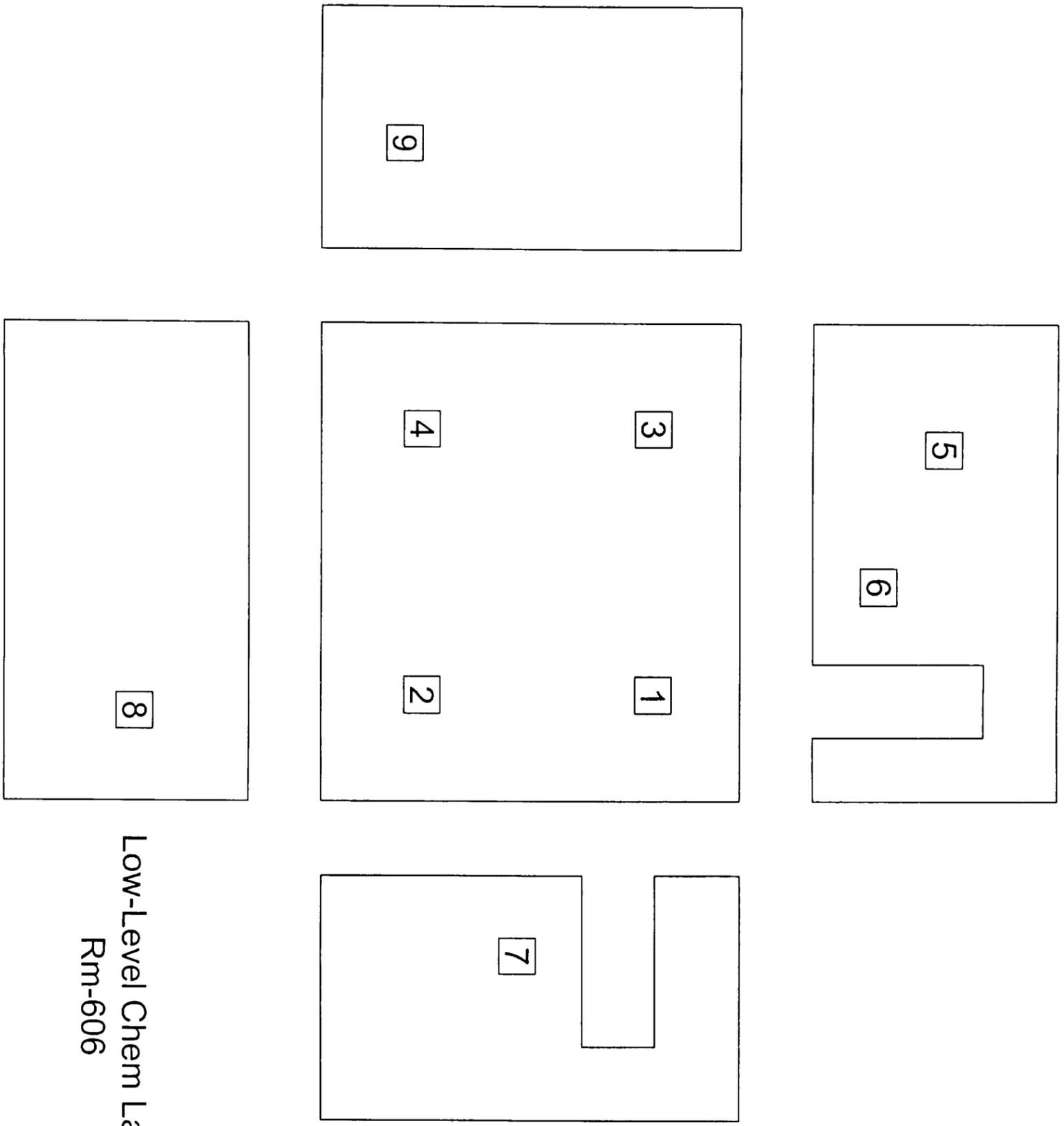


Figure H.4c

Elevated Total Activity Locations



Low-Level Chem Lab  
Rm-606

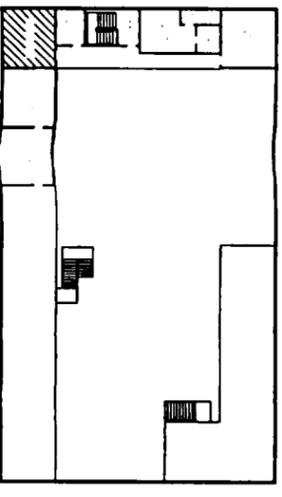
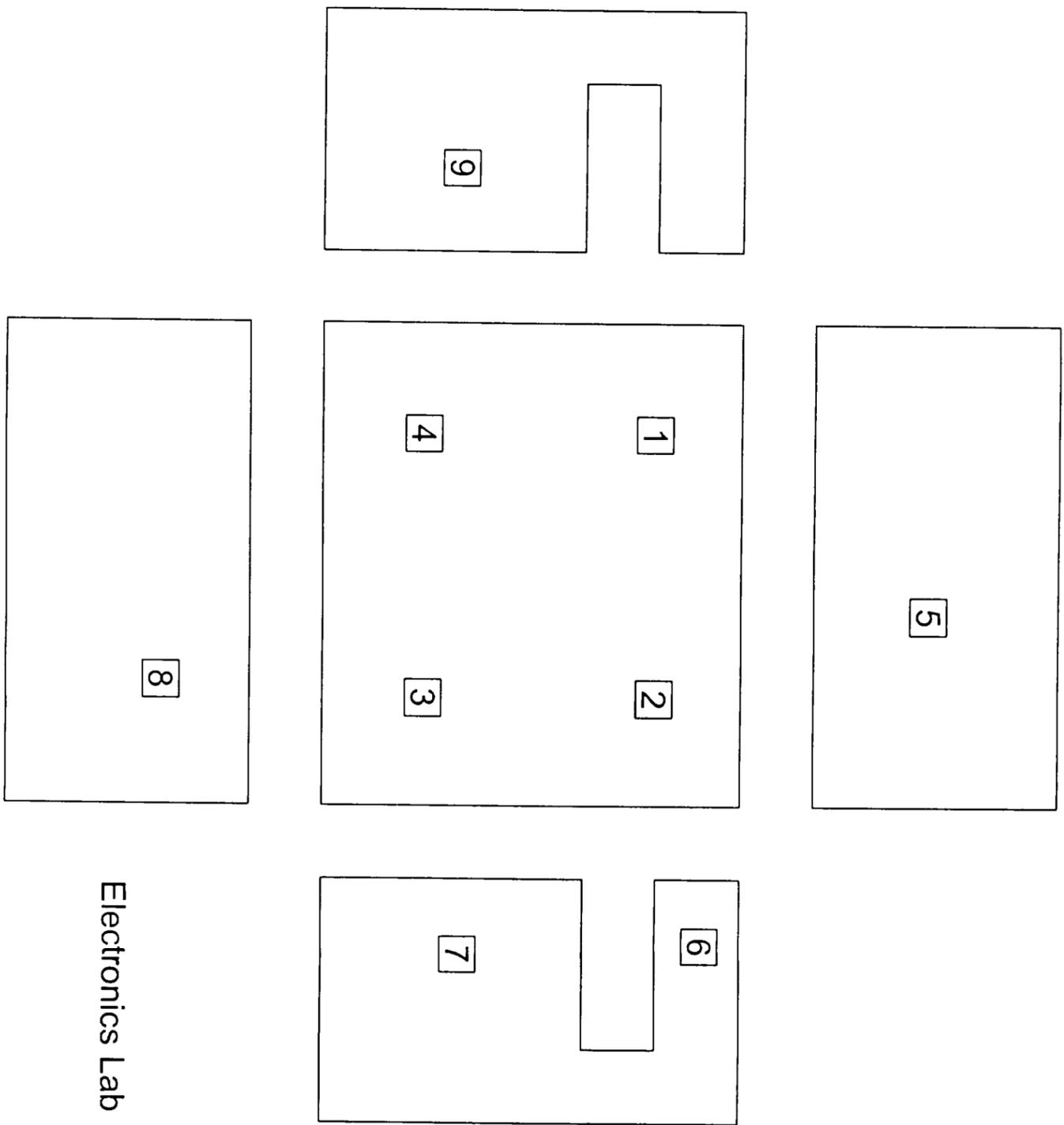


Figure H.5

Low-level Chem Lab Survey Locations



Electronics Lab

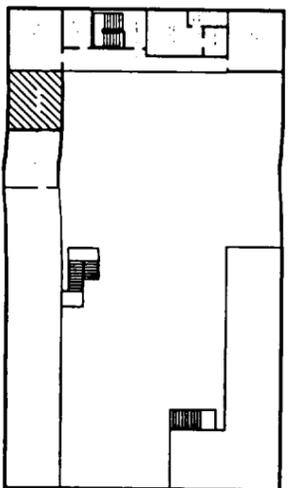


Figure H.6

Electronics Lab Survey Locations

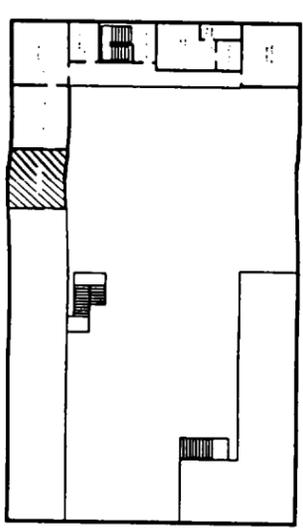
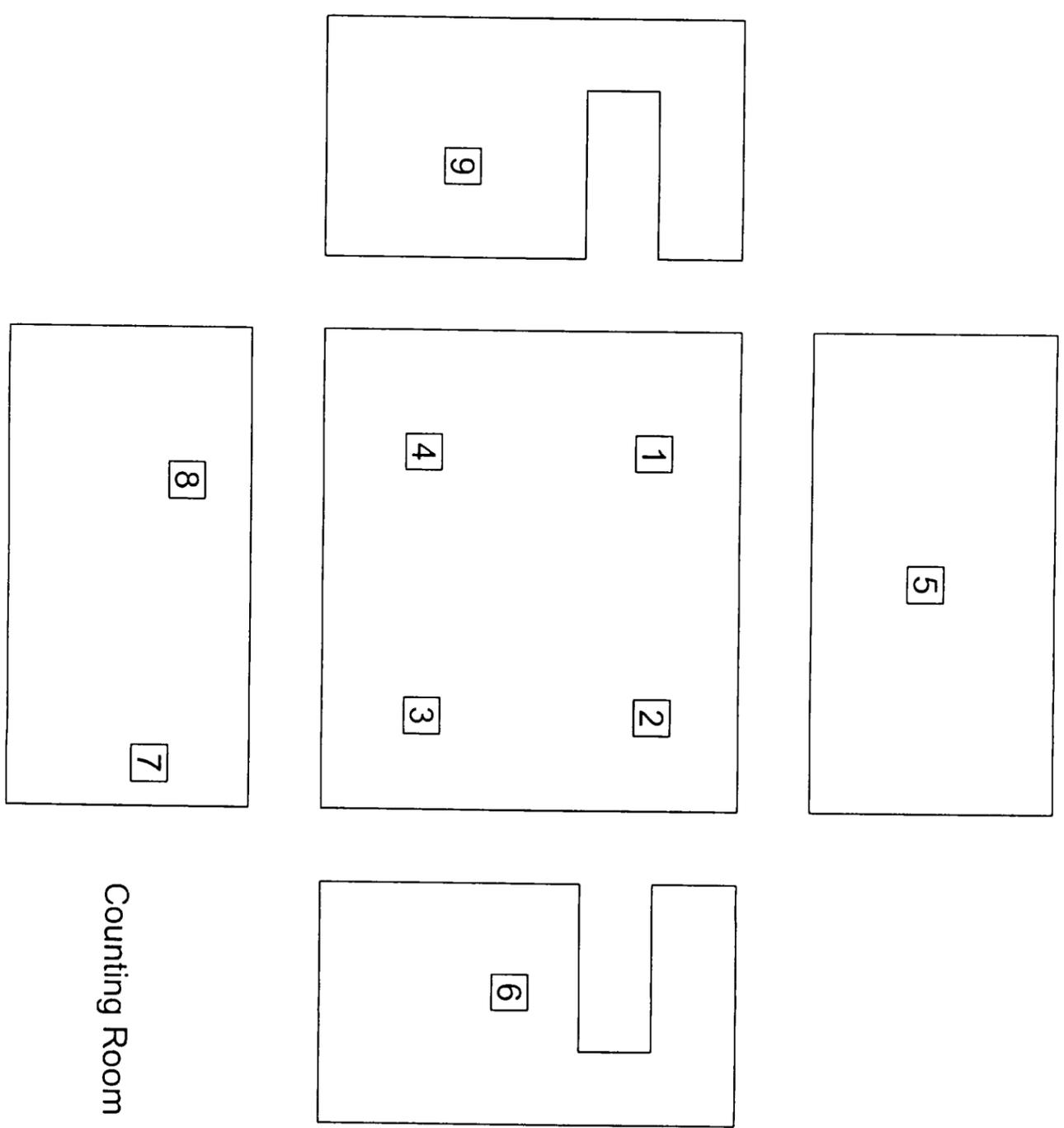


Figure H.7

Counting Room Survey Locations



**Appendix I**

**Facility Radiological Survey Data**

## North Lab

Date: 8/3/2004		Time: 9:30		Survey No.: Alc-001			Perf. By: Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
2221	68535	43-68	153801	α	0.104	1	1.6	10	5	126
2929	196231	43-10-1	203053	α	0.344	1	0.5	10	1	N/A
2221	117370	43-37	120106	α	0.109	1	6.4	10	Scan	540

Location	Surface	Total Alpha Activity (dpm/100cm <sup>2</sup> )					Removable Alpha Activity (dpm/100cm <sup>2</sup> )			
		Scan	Static Measurement				Activity	Uncertainty	MDA	Notes
		Activity	Activity	Uncertainty	MDA	Notes				
1	Floor	<30	2	9	22	<MDA	-1	0	16	<MDA
2	Floor	<30	18	14	22	<MDA	1	6	16	<MDA
3	Floor	<30	24	15	22		-1	0	16	<MDA
4	Floor	<30	8	11	22	<MDA	-1	0	16	<MDA
5	N. Wall	<300	2	9	22	<MDA	-1	0	16	<MDA
6	W. Wall	<300	8	11	22	<MDA	-1	0	16	<MDA
7	S. Wall	<300	5	10	22	<MDA	1	6	16	<MDA
8	E. Wall	<300	2	9	22	<MDA	-1	0	16	<MDA
9	E. Wall	<300	3	10	22	<MDA	-1	0	16	<MDA

## North Lab

Date:		8/3/2004		Time:		9:30		Survey No.:			Alc-001			Perf. By:			Alderson/Hrezo/Palmer		
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )									
Selectra	459	IDP-6	K-163	b-g	0.104	1	275	1	1	100									
2929	196231	43-10-1	203053	b-g	0.214	1	45	10	1	N/A									
2221	117370	43-37	120106	b-g	0.175	1	1100	10	Scan	540									
Location	Surface	<i>Total Beta/Gamma Activity (dpm/100cm<sup>2</sup>)</i>					<i>Removable Beta Activity (dpm/100cm<sup>2</sup>)</i>												
		<i>Scan</i>		<i>Static Measurement</i>			<i>Activity</i>		<i>Uncertainty</i>										
		Activity	Activity	Uncertainty	MDA	Notes	Activity	Uncertainty	MDA	Notes									
1	Floor	<750	721	471	771	<MDA	-9	60	122	<MDA									
2	Floor	<750	654	469	771	<MDA	5	62	122	<MDA									
3	Floor	<750	548	464	771	<MDA	19	64	122	<MDA									
4	Floor	<750	192	450	771	<MDA	9	63	122	<MDA									
5	N. Wall	<2100	-77	439	771	<MDA	14	64	122	<MDA									
6	W. Wall	<2100	87	446	771	<MDA	28	66	122	<MDA									
7	S. Wall	<2100	1692	508	771		-14	60	122	<MDA									
8	E. Wall	<2100	1827	513	771		0	62	122	<MDA									
9	E. Wall	<2100	365	457	771	<MDA	42	68	122	<MDA									

## North Lab

<b>Date:</b> 8/3/2004		<b>Time:</b> 9:30		<b>Survey No.:</b> Alc-001			<b>Perf. By:</b> Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
Tri-Carb		N/A	N/A	b-g	N/A	1	N/A	10	1	N/A
Location	Surface	H-3 (dpm/100 cm <sup>2</sup> )			C-14 (dpm/100 cm <sup>2</sup> )		Channel 156-2000 (cpm/100 cm <sup>2</sup> )			
1	Floor	28			13		17			
2	Floor	33			9		15			
3	Floor	42			8		24			
4	Floor	37			7		9			
5	N. Wall	28			22		11			
6	W. Wall	45			13		9			
7	S. Wall	26			16		19			
8	E. Wall	33			19		9			
9	E. Wall	45			20		12			

## Chem Lab (High Level)

Date: 8/3/2004		Time: 9:30		Survey No.: Alc-002			Perf. By: Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
2221	68535	43-68	153801	α	0.104	1	1.6	10	5	126
2929	196231	43-10-1	203053	α	0.344	1	0.5	10	1	N/A
2221	117370	43-37	120106	α	0.109	1	6.4	10	Scan	540

Location	Surface	Total Alpha Activity (dpm/100cm <sup>2</sup> )					Removable Alpha Activity (dpm/100cm <sup>2</sup> )			
		Scan	Static Measurement				Activity	Uncertainty	MDA	Notes
		Activity	Activity	Uncertainty	MDA	Notes				
1	Floor	<30	9	11	22	<MDA	1	6	16	<MDA
2	Floor	<30	0	9	22	<MDA	-1	0	16	<MDA
3	Floor	<30	12	12	22	<MDA	-1	0	16	<MDA
4	Floor	<30	6	11	22	<MDA	-1	0	16	<MDA
5	Floor	<30	2	9	22	<MDA	-1	0	16	<MDA
6	Floor	<30	5	10	22	<MDA	-1	0	16	<MDA
7	Floor	<30	2	9	22	<MDA	-1	0	16	<MDA
8	Floor	<30	14	12	22	<MDA	-1	0	16	<MDA
9	Floor	<30	21	14	22	<MDA	-1	0	16	<MDA
10	Floor	<30	2	9	22	<MDA	-1	0	16	<MDA
11	W. Wall Metal. Rm.	<300	3	10	22	<MDA	1	6	16	<MDA
12	E. Wall Metal. Rm.	<300	-2	8	22	<MDA	-1	0	16	<MDA
13	S. Wall Metal. Rm.	<300	0	9	22	<MDA	-1	0	16	<MDA
14	N. Wall Dark Rm.	<300	3	10	22	<MDA	-1	0	16	<MDA
15	W. Wall Dark Rm.	<300	6	11	22	<MDA	-1	0	16	<MDA
16	E. Wall Dark Rm.	<300	8	11	22	<MDA	-1	0	16	<MDA
17	E. Wall Chem. Lab.	<300	2	9	22	<MDA	-1	0	16	<MDA
18	S. Wall Chem. Lab.	<300	12	12	22	<MDA	4	8	16	<MDA
19	W. Wall Chem. Lab.	<300	5	10	22	<MDA	-1	0	16	<MDA
20	E. Partition Corridor	<300	15	13	22	<MDA	1	6	16	<MDA
21	N. Wall Stairwell	<300	40	18	22		1	6	16	<MDA
22	W. Wall Corridor	<300	43	18	22		1	6	16	<MDA
23	Cabinet Front	<300	11	12	22	<MDA	1	6	16	<MDA

## Chem Lab (High Level)

Date:		8/3/2004		Time:		9:30		Survey No.:		Alc-002		Perf. By:		Alderson/Hrezo/Palmer	
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )					
Selectra	459	IDP-6	K-163	b-g	0.104	1	275	1	1	100					
2929	196231	43-10-1	203053	b-g	0.214	1	45	10	1	N/A					
2221	117370	43-37	120106	b-g	0.175	1	1100	10	Scan	540					
Location	Surface	Total Beta/Gamma Activity (dpm/100cm <sup>2</sup> )					Removable Beta Activity (dpm/100cm <sup>2</sup> )								
		Scan	Static Measurement				Activity	Uncertainty	MDA	Notes					
		Activity	Activity	Uncertainty	MDA	Notes									
1	Floor	750	375	457	771	<MDA	5	62	122	<MDA					
2	Floor	750	365	457	771	<MDA	19	64	122	<MDA					
3	Floor	750	144	448	771	<MDA	51	69	122	<MDA					
4	Floor	750	981	481	771		-33	57	122	<MDA					
5	Floor	750	1404	497	771		33	66	122	<MDA					
6	Floor	750	779	473	771		-61	52	122	<MDA					
7	Floor	750	442	460	771	<MDA	-9	60	122	<MDA					
8	Floor	750	529	464	771	<MDA	23	65	122	<MDA					
9	Floor	750	1048	484	771		37	67	122	<MDA					
10	Floor	750	769	473	771	<MDA	-56	53	122	<MDA					
11	W. Wall Metal. Rm.		2337	531	771		19	64	122	<MDA					
12	E. Wall Metal. Rm.	<2100	346	456	771	<MDA	23	65	122	<MDA					
13	S. Wall Metal. Rm.	<2100	894	478	771		37	67	122	<MDA					
14	N. Wall Dark Rm.	<2100	2029	520	771		14	64	122	<MDA					
15	W. Wall Dark Rm.	<2100	712	471	771	<MDA	-19	59	122	<MDA					
16	E. Wall Dark Rm.	<2100	1923	516	771		47	68	122	<MDA					
17	E. Wall Chem. Lab.	<2100	1904	515	771		0	62	122	<MDA					
18	S. Wall Chem. Lab.	<2100	1769	511	771		23	65	122	<MDA					
19	W. Wall Chem. Lab.	<2100	1933	516	771		0	62	122	<MDA					
20	E. Partition Corridor	<2100	-356	427	771	<MDA	-33	57	122	<MDA					
21	N. Wall Stairwell		2692	543	771		51	69	122	<MDA					
22	W. Wall Corridor	<2100	1538	502	771		9	63	122	<MDA					
23	Cabinet Front		15096	868	771		65	71	122	<MDA					

### Chem Lab (High Level)

Date: 8/3/2004		Time: 9:30		Survey No.: Alc-002			Perf. By: Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
Tri-Carb 2200	86252	N/A	N/A	b-g	N/A	1	N/A	10	1	N/A
Location	Surface	H-3 (dpm/100 cm <sup>2</sup> )			C-14 (dpm/100 cm <sup>2</sup> )		Channel 156-2000 (cpm/100 cm <sup>2</sup> )			
1	Floor	50			14		16			
2	Floor	32			6		12			
3	Floor	62			15		9			
4	Floor	36			23		13			
5	Floor	58			20		7			
6	Floor	49			25		16			
7	Floor	35			12		8			
8	Floor	31			17		9			
9	Floor	41			19		15			
10	Floor	32			22		12			
11	W. Wall Metal. Rm.	33			10		21			
12	E. Wall Metal. Rm.	51			17		18			
13	S. Wall Metal. Rm.	38			15		9			
14	N. Wall Dark Rm.	50			16		15			
15	W. Wall Dark Rm.	21			16		12			
16	E. Wall Dark Rm.	40			15		8			
17	E. Wall Chem. Lab.	21			25		18			
18	S. Wall Chem. Lab.	32			19		17			
19	W. Wall Chem. Lab.	40			12		12			
20	E. Partition Corridor	37			24		14			
21	N. Wall Stairwell	36			13		13			
22	W. Wall Corridor	34			12		17			
23	Cabinet Front	55			22		16			

## Isotope Storage

Date: 8/3/2004		Time: 9:30		Survey No.: Alc-003			Perf. By: Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
2221	68535	43-68	153801	α	0.104	1	1.6	10	5	126
2929	196231	43-10-1	203053	α	0.344	1	0.5	10	1	N/A
2221	117370	43-37	120106	α	0.109	1	6.4	10	Scan	540

Location	Surface	Total Alpha Activity (dpm/100cm <sup>2</sup> )					Removable Alpha Activity (dpm/100cm <sup>2</sup> )			
		Scan	Static Measurement				Activity	Uncertainty	MDA	Notes
		Activity	Activity	Uncertainty	MDA	Notes				
1	Floor	<30	5	10	22	<MDA	-1	0	16	<MDA
2	Floor	<30	-8	6	22	<MDA	-1	0	16	<MDA
3	Floor	<30	-2	8	22	<MDA	-1	0	16	<MDA
4	Floor	<30	2	9	22	<MDA	4	8	16	<MDA
5	W. Wall Corridor	<300	46	19	22		1	6	16	<MDA
6	S. Wall Corridor	<300	2	9	22	<MDA	-1	0	16	<MDA
7	N. Wall Isotope Stg.	<300	8	11	22	<MDA	-1	0	16	<MDA
8	Eqmt Shelf	<300	14	12	22	<MDA	-1	0	16	<MDA
9	E. Wall Isotope Stg.	<300	5	10	22	<MDA	1	6	16	<MDA
10	E. Wall Corridor	<300	2	9	22	<MDA	4	8	16	<MDA
Post Sampling										
1	Floor	---	---	---	---	---	0	0	16	<MDA
2	Floor	---	---	---	---	---	0	0	16	<MDA
3	Floor	---	---	---	---	---	1	6	16	<MDA
4	Floor	---	---	---	---	---	0	0	16	<MDA
5	Floor	---	---	---	---	---	0	0	16	<MDA
6	Floor	---	---	---	---	---	0	0	16	<MDA
7	Floor	---	---	---	---	---	0	0	16	<MDA
8	Floor	---	---	---	---	---	1	6	16	<MDA
9	Floor	---	---	---	---	---	0	0	16	<MDA
10	Floor	---	---	---	---	---	2	8	16	<MDA
11	Floor	---	---	---	---	---	1	6	16	<MDA
12	Floor	---	---	---	---	---	1	6	16	<MDA

## Isotope Storage Room

Date:		8/3/2004		Time:		9:30		Survey No.:		Alc-003		Perf. By:		Alderson/Hrezo/Palmer	
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )					
Selectra	459	IDP-6	K-163	b-g	0.104	1	275	1	1	100					
2929	196231	43-10-1	203053	b-g	0.214	1	45	10	1	N/A					
2221	117370	43-37	120106	b-g	0.175	1	1100	10	Scan	540					
		<b>Total Beta/Gamma Activity (dpm/100cm<sup>2</sup>)</b>					<b>Removable Beta Activity (dpm/100cm<sup>2</sup>)</b>								
Location	Surface	<b>Scan</b>		<b>Static Measurement</b>			Activity	Uncertainty	MDA	Notes					
		Activity	Activity	Uncertainty	MDA	Notes									
1	Floor		923	479	771		14	64	122	<MDA					
2	Floor	<750	308	455	771	<MDA	37	67	122	<MDA					
3	Floor		295433	3333	771		33	66	122	<MDA					
4	Floor	<750	663	469	771	<MDA	-9	60	122	<MDA					
5	W. Wall Corridor	<2100	1933	516	771		70	71	122	<MDA					
6	S. Wall Corridor	<2100	115	447	771	<MDA	19	64	122	<MDA					
7	N. Wall Isotope Stg	<2100	1510	501	771		70	71	122	<MDA					
8	Eqmt Shelf	<2100	365	457	771	<MDA	-19	59	122	<MDA					
9	E. Wall Isotope Stg	<2100	96	446	771	<MDA	33	66	122	<MDA					
10	E. Wall Corridor	<2100	-721	411	771	<MDA	19	64	122	<MDA					
Post Sampling															
1	Floor	---	---	---	---	---	54	68	122	<MDA					
2	Floor	---	---	---	---	---	64	74	122	<MDA					
3	Floor	---	---	---	---	---	55	68	122	<MDA					
4	Floor	---	---	---	---	---	47	63	122	<MDA					
5	Floor	---	---	---	---	---	56	69	122	<MDA					
6	Floor	---	---	---	---	---	49	64	122	<MDA					
7	Floor	---	---	---	---	---	52	66	122	<MDA					
8	Floor	---	---	---	---	---	44	61	122	<MDA					
9	Floor	---	---	---	---	---	34	54	122	<MDA					
10	Floor	---	---	---	---	---	55	68	122	<MDA					
11	Floor	---	---	---	---	---	49	64	122	<MDA					
12	Floor	---	---	---	---	---	54	68	122	<MDA					
Note: Post Sampling wipes performed 8/4/2004 15:00															

## Isotope Storage Room Elevated Activity Locations

<b>Date:</b> 8/4/2004		<b>Time:</b> 15:00		<b>Survey No.:</b> Alc-003			<b>Perf. By:</b> Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
Selectra	459	IDP-6	K-163	b-g	0.104	1	275	1	1	100
<b>Location</b>	<b>Surface</b>	<b>Total Beta/Gamma Activity (dpm/100cm<sup>2</sup>)</b>					<b>Removable Beta Activity (dpm/100cm<sup>2</sup>)</b>			
		<b>Scan Activity</b>	<b>Static Measurement</b>				<b>Activity</b>	<b>Uncertainty</b>	<b>MDA</b>	<b>Notes</b>
		<b>Activity</b>	<b>Uncertainty</b>	<b>MDA</b>	<b>Notes</b>					
1	Floor	---	70433	1672	771		---	---	---	---
2	Floor	---	49279	1420	771		---	---	---	---
3	Floor	---	122356	2171	771		---	---	---	---
4	Floor	---	295433	3333	771		---	---	---	---
5	Floor	---	22356	1011	771		---	---	---	---
6	Floor	---	7308	682	771		---	---	---	---
7	Floor	---	25240	1062	771		---	---	---	---
<b>Post Sampling</b>										
1	Floor	---	4481	601	771		---	---	---	---
2	Floor	---	3490	569	771		---	---	---	---
3	Floor	---	4279	594	771		---	---	---	---
4	Floor	---	6913	671	771		---	---	---	---
5	Floor	---	3750	578	771		---	---	---	---
6	Floor	---	6433	658	771		---	---	---	---
7	Floor	---	1846	513	771		---	---	---	---

## Isotope Storage Room

Date:		8/3/2004		Time:		9:30		Survey No.:			Alc-003			Perf. By:			Alderson/Hrezo/Palmer		
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )									
Tri-Carb 2200	86252	N/A	N/A	b-g	N/A	1	N/A	10	1	N/A									
Location	Surface	H-3 (dpm/100 cm <sup>2</sup> )			C-14 (dpm/100 cm <sup>2</sup> )			Channel 156-2000 (cpm/100 cm <sup>2</sup> )											
1	Floor	36			19			6											
2	Floor	34			23			6											
3	Floor	37			24			18											
4	Floor	23			11			11											
5	W. Wall Corridor	0			116			13											
6	S. Wall Corridor	18			20			23											
7	N. Wall Isotope Stg.	41			22			12											
8	Eqmt Shelf	39			20			11											
9	E. Wall Isotope Stg.	34			20			18											
10	E. Wall Corridor	22			7			18											
Post Sampling																			
1	Floor	35			12			10											
2	Floor	17			14			10											
3	Floor	31			12			14											
4	Floor	43			11			18											
5	Floor	40			17			15											
6	Floor	31			14			17											
7	Floor	30			11			16											
8	Floor	54			7			10											
9	Floor	40			17			16											
10	Floor	33			13			12											
11	Floor	38			11			15											
12	Floor	42			10			14											

## Low Level Chem Lab

<b>Date:</b> 8/3/2004		<b>Time:</b> 13:30		<b>Survey No.:</b> Alc-004			<b>Perf. By:</b> Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
2221	68535	43-68	153801	α	0.104	1	1.6	10	5	126
2929	196231	43-10-1	203053	α	0.344	1	0.5	10	1	N/A
2221	117370	43-37	120106	α	0.109	1	6.4	10	Scan	540

Location	Surface	Total Alpha Activity (dpm/100cm <sup>2</sup> )					Removable Alpha Activity (dpm/100cm <sup>2</sup> )			
		Scan	Static Measurement				Activity	Uncertainty	MDA	Notes
		Activity	Activity	Uncertainty	MDA	Notes				
1	Floor	<30	3	10	22	<MDA	-1	0	16	<MDA
2	Floor	<30	8	11	22	<MDA	-1	0	16	<MDA
3	Floor	<30	6	11	22	<MDA	-1	0	16	<MDA
4	Floor	<30	3	10	22	<MDA	1	6	16	<MDA
5	N. Wall	<300	5	10	22	<MDA	-1	0	16	<MDA
6	N. Wall	<300	3	10	22	<MDA	-1	0	16	<MDA
7	E. Wall	<300	6	11	22	<MDA	1	6	16	<MDA
8	S. Wall	<300	6	11	22	<MDA	1	6	16	<MDA
9	W. Wall	<300	14	12	22	<MDA	-1	0	16	<MDA

## Low Level Chem Lab

Date:		8/3/2004		Time:		13:30		Survey No.:		Alc-004		Perf. By:		Alderson/Hrezo/Palmer	
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )					
Selectra	459	IDP-6	K-163	b-g	0.104	1	275	1	1	100					
2929	196231	43-10-1	203053	b-g	0.214	1	45	10	1	N/A					
2221	117370	43-37	120106	b-g	0.175	1	1100	10	Scan	540					
Location	Surface	<i>Total Beta/Gamma Activity (dpm/100cm<sup>2</sup>)</i>					<i>Removable Beta Activity (dpm/100cm<sup>2</sup>)</i>								
		<i>Scan</i>		<i>Static Measurement</i>			<i>Scan</i>		<i>Static Measurement</i>						
		Activity	Activity	Uncertainty	MDA	Notes	Activity	Uncertainty	MDA	Notes					
1	Floor	<750	-163	435	771	<MDA	23	65	122	<MDA					
2	Floor	<750	67	445	771	<MDA	42	68	122	<MDA					
3	Floor	<750	-212	433	771	<MDA	33	66	122	<MDA					
4	Floor	<750	-10	442	771	<MDA	14	64	122	<MDA					
5	N. Wall	<2100	-269	431	771	<MDA	14	64	122	<MDA					
6	N. Wall	<2100	-577	417	771	<MDA	56	69	122	<MDA					
7	E. Wall	<2100	-423	424	771	<MDA	19	64	122	<MDA					
8	S. Wall	<2100	1817	512	771		-37	56	122	<MDA					
9	W. Wall		2240	527	771		28	66	122	<MDA					

## Low Level Chem Lab

Date: 8/3/2004		Time: 13:30		Survey No.: Alc-004			Perf. By: Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
Tri-Carb 2200	86252	N/A	N/A	b-g	N/A	1	N/A	10	1	N/A
Location	Surface	H-3 (dpm/100 cm <sup>2</sup> )			C-14 (dpm/100 cm <sup>2</sup> )			Channel 156-2000 (cpm/100 cm <sup>2</sup> )		
1	Floor	44			21			19		
2	Floor	23			10			23		
3	Floor	23			24			19		
4	Floor	47			14			11		
5	N. Wall	37			10			18		
6	N. Wall	39			13			14		
7	E. Wall	31			19			14		
8	S. Wall	29			18			16		
9	W. Wall	30			9			12		

## Electronics Lab

Date: 8/4/2004		Time: 9:30		Survey No.: Alc-005			Perf. By Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
2221	68535	43-68	153801	α	0.104	1	1.6	10	5	126
2929	196231	43-10-1	203053	α	0.344	1	0.5	10	1	N/A
2221	117370	43-37	120106	α	0.109	1	6.4	10	Scan	540

Location	Surface	Total Alpha Activity (dpm/100cm <sup>2</sup> )					Removable Alpha Activity (dpm/100cm <sup>2</sup> )			
		Scan	Static Measurement				Activity	Uncertainty	MDA	Notes
		Activity	Activity	Uncertainty	MDA	Notes				
1	Floor	<30	5	10	22	<MDA	-1	0	16	<MDA
2	Floor	<30	0	9	22	<MDA	1	6	16	<MDA
3	Floor	<30	9	11	22	<MDA	-1	0	16	<MDA
4	Floor	<30	-2	8	22	<MDA	1	6	16	<MDA
5	N. Wall	<300	2	9	22	<MDA	-1	0	16	<MDA
6	E. Wall	<300	6	11	22	<MDA	-1	0	16	<MDA
7	E. Wall	<300	5	10	22	<MDA	1	6	16	<MDA
8	S. Wall	<300	0	9	22	<MDA	-1	0	16	<MDA
9	W. Wall	<300	3	10	22	<MDA	-1	0	16	<MDA

## Electronics Lab

Electronics Lab										
Date: 8/4/2004		Time: 9:30		Survey No.: Alc-005			Perf. By: Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
Selectra	459	IDP-6	K-163	b-g	0.104	1	275	1	1	100
2929	196231	43-10-1	203053	b-g	0.214	1	45	10	1	N/A
2221	117370	43-37	120106	b-g	0.175	1	1100	10	Scan	540
		<b>Total Beta/Gamma Activity (dpm/100cm<sup>2</sup>)</b>					<b>Removable Beta Activity (dpm/100cm<sup>2</sup>)</b>			
		<b>Scan</b>		<b>Static Measurement</b>						
Location	Surface	Activity	Activity	Uncertainty	MDA	Notes	Activity	Uncertainty	MDA	Notes
1	Floor	<750	-500	421	771	<MDA	47	68	122	<MDA
2	Floor	<750	-288	430	771	<MDA	28	66	122	<MDA
3	Floor	<750	-279	430	771	<MDA	14	64	122	<MDA
4	Floor	<750	29	443	771	<MDA	19	64	122	<MDA
5	N. Wall	<2100	-481	421	771	<MDA	-28	58	122	<MDA
6	E. Wall	<2100	-500	421	771	<MDA	65	71	122	<MDA
7	E. Wall	<2100	-327	428	771	<MDA	28	66	122	<MDA
8	S. Wall		2433	534	771		5	62	122	<MDA
9	W. Wall	<2100	-58	440	771	<MDA	9	63	122	<MDA

## Electronics Lab

Date:		8/4/2004		Time:		9:30		Survey No.:		Alc-005		Perf. By:		Alderson/Hrezo/Palmer	
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )					
Tri-Carb 2200	86252	N/A	N/A	b-g	N/A	1	N/A	10	1	N/A					
Location	Surface	H-3 (dpm/100 cm <sup>2</sup> )			C-14 (dpm/100 cm <sup>2</sup> )			Channel 156-2000 (cpm/100 cm <sup>2</sup> )							
1	Floor	46			20			15							
2	Floor	46			10			18							
3	Floor	21			22			17							
4	Floor	30			17			14							
5	N. Wall	30			12			17							
6	E. Wall	30			13			14							
7	E. Wall	36			15			13							
8	S. Wall	44			18			16							
9	W. Wall	51			28			15							

## Counting Room

Date: 8/4/2004		Time: 11:30		Survey No.: Alc-006			Perf. By: Alderson/Hrezo/Palmer			
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )
2221	68535	43-68	153801	α	0.204	1	1.6	10	5	126
2929	196231	43-10-1	203053	α	0.344	1	0.5	10	1	N/A
2221	117370	43-37	120106	α	0.109	1	6.4	10	Scan	540

Location	Surface	Total Alpha Activity (dpm/100cm <sup>2</sup> )					Removable Alpha Activity (dpm/100cm <sup>2</sup> )			
		Scan	Static Measurement				Static Measurement			
		Activity	Activity	Uncertainty	MDA	Notes	Activity	Uncertainty	MDA	Notes
1	Floor	<30	0	4	11	<MDA	-1	0	16	<MDA
2	Floor	<30	3	5	11	<MDA	-1	0	16	<MDA
3	Floor	<30	5	6	11	<MDA	1	6	16	<MDA
4	Floor	<30	0	4	11	<MDA	-1	0	16	<MDA
5	N. Wall	<300	0	4	11	<MDA	-1	0	16	<MDA
6	E. Wall	<300	3	5	11	<MDA	-1	0	16	<MDA
7	S. Wall	<300	2	5	11	<MDA	-1	0	16	<MDA
8	S. Wall	<300	0	4	11	<MDA	-1	0	16	<MDA
9	W. Wall	<300	2	5	11	<MDA	-1	0	16	<MDA

## Counting Room

Date:		8/4/2004		Time:		11:30		Survey No.:		Alc-006		Perf. By:		Alderson/Hrezo/Palmer	
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )					
Selectra	459	IDP-6	K-163	b-g	0.104	1	275	1	1	100					
2929	196231	43-10-1	203053	b-g	0.214	1	45	10	1	N/A					
2221	117370	43-37	120106	b-g	0.175	1	1100	10	Scan	540					
		<b>Total Beta/Gamma Activity (dpm/100cm<sup>2</sup>)</b>					<b>Removable Beta Activity (dpm/100cm<sup>2</sup>)</b>								
		<b>Scan</b>		<b>Static Measurement</b>			<b>Static Measurement</b>								
Location	Surface	Activity	Activity	Uncertainty	MDA	Notes	Activity	Uncertainty	MDA	Notes					
1	Floor	<750	-231	432	771	<MDA	5	62	122	<MDA					
2	Floor	<750	-356	427	771	<MDA	0	62	122	<MDA					
3	Floor	<750	-58	440	771	<MDA	42	68	122	<MDA					
4	Floor	<750	-115	437	771	<MDA	42	68	122	<MDA					
5	N. Wall	<2100	-404	425	771	<MDA	75	72	122	<MDA					
6	E. Wall	<2100	0	442	771	<MDA	-28	58	122	<MDA					
7	S. Wall	<2100	1962	517	771		33	66	122	<MDA					
8	S. Wall	<2100	163	449	771	<MDA	-5	61	122	<MDA					
9	W. Wall	<2100	-279	430	771	<MDA	-5	61	122	<MDA					

## Counting Room

Counting Room																
Date:		8/4/2004		Time:		11:30		Survey No.:		Alc-006		Perf. By:		Alderson/Hrezo/Palmer		
Instrument	Serial	Detector	Serial	Radiation	Efficiency	Yield	Bkg CPM	Bkg CT (min)	Samp CT (min)	Probe Area (cm <sup>2</sup> )						
Tri-Carb 2200	86252	N/A	N/A	b-g	N/A	1	N/A	10	1	N/A						
Location	Surface	H-3 (dpm/100 cm <sup>2</sup> )			C-14 (dpm/100 cm <sup>2</sup> )			Channel 156-2000 (cpm/100 cm <sup>2</sup> )								
1	Floor	37			15			6								
2	Floor	22			10			6								
3	Floor	42			16			18								
4	Floor	20			26			11								
5	N. Wall	40			9			13								
6	E. Wall	43			18			23								
7	S. Wall	26			24			12								
8	S. Wall	25			12			11								
9	W. Wall	25			19			18								

**Appendix J**

**RESRAD-Build Run**

Title : 15,100 dpm/100 cm2 Cs-137

Input File : C:\Program Files\FESPAD\_family\BUILD\Aldoa1.bld

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FESPAD-BUILD Table of Contents

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Title : 15,100 dpm/100 cm2 Cs-137

Input File : C:\Program Files\FESPAD\_Family\BUILD\Aldosi.Ltd

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FESPAD-BUILD Input Parameters

---

---

Number of Sources : 1  
Number of Receptors: 1  
Total Time : 3.650000E+02 days  
Fraction Inside : 5.000000E-01

---

Receptor Information

---

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion(Dust)
		[m]	[m]	[m]		[m <sup>3</sup> /day]	[mCi/hr]
1	1	1.000	0.000	1.000	1.000	1.80E+01	1.00E-04

---

Receptor-Source Shielding Relationship

---

Receptor	Source	Density	Thickness	Material
		[g/cm <sup>3</sup> ]	[cm]	
1	1	2.40E+00	0.00E+00	Concrete

Title : 15,100 Bq/m<sup>3</sup> Cs-137

Input File : C:\Program Files\PEUFAC\Family\BUILD\Alcoa1.BLD

----- Building Information -----

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Air Exchanges [m <sup>3</sup> /hr]	
Area [m <sup>2</sup> ]	.....	
	.	.
	.	.
	.	Q=C01: 7.00E+01
Hi: 2.500	Room 1	Q10 : 7.00E+01
	LAMBDA: 8.00E-01	.
Area 56.000	.	.
	.	.
	.....	

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

Title : 15,110 dpm/110 cm2 Cs-137

Input File : C:\Program Files\MFCSPAD\_Family\BUILD\Alcal1.11d

----- Source Information -----

Source: 1

Location: Poom : 1 x: 0.00 y: 0.00 z: 0.00[m]  
Geometry: Type: Area Area:1.00E-02 [m2] Direction: x  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination:

Nuclide	Concentration [dpm/m2]	Dose Conversion Factor (Library: BUILD)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ 1dpm/m2]
Cs-137	1.510E+06	2.251E-05	1.437E-05	1.437E-03

Title : 10,100 dpm/100 cm2 Cs-137

Input File : C:\Program Files\RESRAD\_Family\EUILD\Alcoal.tld

Evaluation Time: 0.0000000E+00 years

=====

----- Assessment for Time: 1 -----

----- Time =0.00E+00 yr -----

=====

----- Source Information -----

Source: 1

Location: Room : 1 x: 0.00 y: 0.00 z: 0.00 [m]  
Geometry: Type: Area Area:1.00E-02 [m2] Direction: x  
Pathway :  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 1.000E-01  
Removable fraction: 5.000E-01  
Time to Remove: 3.650E+02 [day]

Contamination:	Nuclide	Concentration [dpm/m2]
	Cs-137	1.510E+06

Title : 15,100 apm/100 cm2 Cs-137

Input File : C:\Program Files\PEFAD\_Family\BUILD\Alccal.L11

Evaluation Time: 0.0000000E+00 years

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PEFAD-BUILD Dose Tables

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Source Contributions to Receptor Doses

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(mrem)

	Source	Total
	1	
Receptor 1	2.63E-03	2.63E-03
Total	2.63E-03	2.63E-03

Title : 15,100 dpm/100 cm2 Cs-137

Input File : C:\Program Files\RESRAD\_Family\RESRAD\Alcal.mlb

Evaluation Time: 0.0000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Padon	Ingestion
1	2.47E-03	8.03E-05	8.28E-07	5.44E-05	0.00E+00	2.07E-04
Total	2.47E-03	8.03E-05	8.28E-07	5.44E-05	0.00E+00	2.07E-04

Title : 15,100 Agn/100 cm2 Cs-137

Input File : C:\Program Files\RESPAD\_Family\NEU1LD\Alcohol.Fld

Evaluation Time: 0.0000000E+00 years

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Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
CS-137		
CS-137	2.83E-03	2.83E-03

Title : 15,100 dpm/100 cm2 Cs-137

Input File : C:\Program Files\RESRAD\_Family\BUILD\Alcoal.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

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(mrem)

Evaluation Time (yr)

0.00E+00

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1 2.83E-03

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Receptor Dose/Yr Averaged Over Exposure Duration

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(mrem/yr)

Evaluation Time (yr)

0.00E+00

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1 2.83E-03

This is to acknowledge the receipt of your letter/application dated

6/21/2005, and to inform you that the initial processing which includes an administrative review has been performed.

Amendment 37-07653-02  
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 137290.  
When calling to inquire about this action, please refer to this control number.  
You may call us on (610) 337-5398, or 337-5260.

BETWEEN: : (FOR LFMS USE)  
 : INFORMATION FROM LTS  
 : -----  
 :  
 License Fee Management Branch, ARM : Program Code: 03120  
 and : Status Code: 0  
 Regional Licensing Sections : Fee Category: 3P  
 : Exp. Date: 20150331  
 : Fee Comments: \_\_\_\_\_  
 : Decom Fin Assur Reqd: N  
 : ::

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED  
 Applicant/Licensee: ALCOA, INC.  
 Received Date: 20050624  
 Docket No: 3006172  
 Control No.: 137290  
 License No.: 37-07653-02  
 Action Type: Amendment

2. FEE ATTACHED  
 Amount: \_\_\_\_\_  
 Check No.: \_\_\_\_\_

3. COMMENTS

Signed *Veronica J. Ford*  
 Date 7/7/2005

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /\_\_/)

1. Fee Category and Amount: \_\_\_\_\_  
 2. Correct Fee Paid. Application may be processed for:  
 Amendment \_\_\_\_\_  
 Renewal \_\_\_\_\_  
 License \_\_\_\_\_  
 3. OTHER \_\_\_\_\_  
 \_\_\_\_\_

Signed \_\_\_\_\_  
 Date \_\_\_\_\_