Confirmatory Survey
of
Gamma Irradiation Facility
DeSoto Facility
Boeing - Rocketdyne
Canoga Park, California

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Background Information for Survey of Gamma Irradiation Facility, DeSoto:

The Gamma Irradiation Facility (GIF) is located in the northeast corner of Building 104 at the DeSoto facility of Rocketdyne Propulsion and Power. It comprised a heavily shield vault or cell with a lead glass window and hydraulic remote manipulators, and an operating gallery room. The facility operated since 1966 as an irradiation facility for sterilization of medical equipment, nuclear reactor component qualification, radiation hardening of space components and food irradiation using sealed cobalt-60 and cesium-137 sources. The GIF was also used to store irradiated specimens from the Mass Spectroscopy Laboratory in the millicurie and microcurie range. Following removal and shipment of these sources to other DOE facilities and/or licensees, the facility was surveyed for residual radioactivity. In June through August of 1998, a final radiological survey was performed of the gamma cell, the operating gallery, ventilation room (connecting the GIF to the roof) and the roof above the GIF where ventilation ducts had been removed. This survey is documented in "Final Radiological Survey Data Package Gamma Irradiation Facility DeSoto, Building 104" (ref doc #1).

Reference Document:

1. Letter 98RC5810 from Phil Rutherford to Lisa Austin dated November 9, 1998 "Gamma Irradiation facility (GIF), Building 104, DeSoto, Release for Unrestricted Use and Removal from Radioactive Materials License 0015-19 with enclosure "Final Radiological Survey Data Package Gamma Irradiation Facility DeSoto, Building 104", November 6, 1998.

Survey Personnel:

Roger Lupo, Lisa Brown, and Xaiosong Yin of the Radiological Assessment Unit of the Radiological Health Branch performed a verification survey of the GIF on October 8, 1998.

Survey Instruments:

Manufacture & Model	S/N	Probe/detector	S/N	Calibration due date
Ludlum model 3	134076	44-2 1x1 NaI Scintillator	PR137133	11/98
Ludlum model 3	134215	44-2 1x1 NaI Scintillator	PR137117	11/98
Ludlum model 19	80382	internal 1x1 NaI Scintillator	NA	6/99
Ludlum model 19	109936	internal 1x1 NaI Scintillator	NA	5/99
Ludlum model 18	105775	44-9 pancake GM	PR110029	11/98
		43-90 100cm^2 α scintillator	PR106316	11/98
Ludlum model 2221	126531	44-10 2x2 NaI Scintillator	PR038043	11/98
Eberline ESP-2	00406	44-9 pancake GM	PR043314	11/98

Survey Report:

On October 8 and 9, 1998, Radiologic Health Branch (RHB) staff, Misters Roger Lupo, Xiaosong Yin and Ms. Lisa Brown performed a confirmatory survey of the Gamma Irradiation Facility (GIF). The GIF includes the Gamma Cell and it's Gallery, the ventilation equipment room above the gallery and the roof section above the GIF with its depressed catch basin for the ventilation exhaust (pit area). Background measurements were taken at an unaffected office area in the same building. The background measurements for the instruments used in the survey are listed in Table 1. The inside wall surface two meters up from the floor and the floor were surveyed with a G-M pancake detector, a microR exposure ratemeter and a 1x1 NaI detector. The scanning survey with the pancake G-M gave a range of measurements of 40 cpm to 60 cpm and with the 1x1 NaI detector the range of measurements was 1500 cpm to 3700 cpm for all areas of the GIF. The general survey of all areas with the exposure ratemeter yielded a range of 8 to 18 microR per hour (μR/hr). No elevated levels were found. The higher readings in the Gamma Cell and the Gallery are due to the concrete enclosed areas being surveyed. See Table 1 for details of the scanning survey. Single point measurements for alpha and beta activity were performed and a swipe sample for the determination of removable activity was collected at selected locations on the floor and walls of the GIF. The results of the measurements are listed in Tables 3 & 4. Figures 1, 2, and 3 show the locations of the contact measurements and the swipe samples collected. Figure 1 is of the ground floor of the GIF (Gamma Cell and Gallery). Figure 2 is of the ventilation equipment room above the GIF gallery. Figure 3 is of the roof of the GIF with its depressed catch basin for the ventilation exhaust.

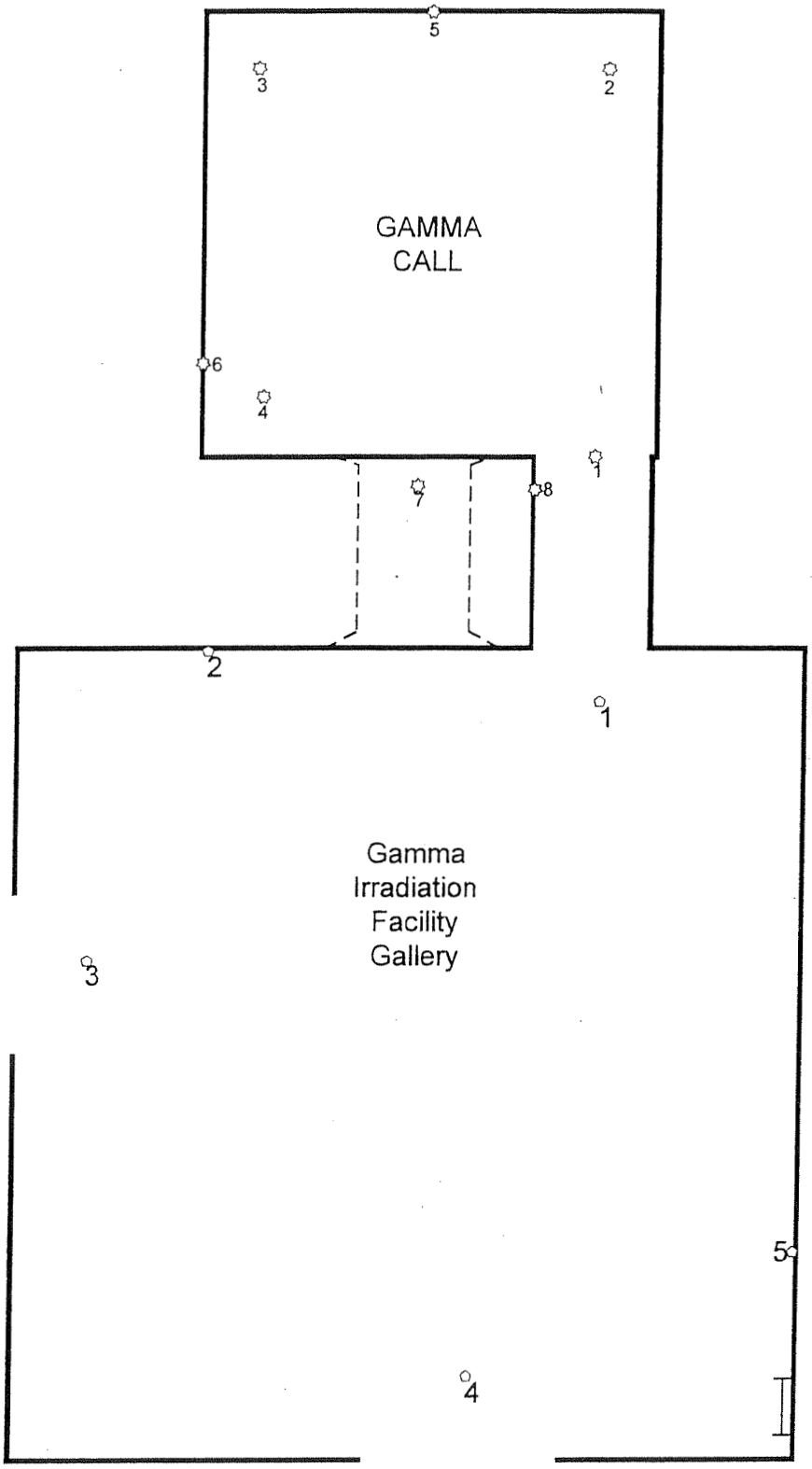

Figure 1: Gamma Irradiation Facility

Indicates contact measurement and swipe sampling location

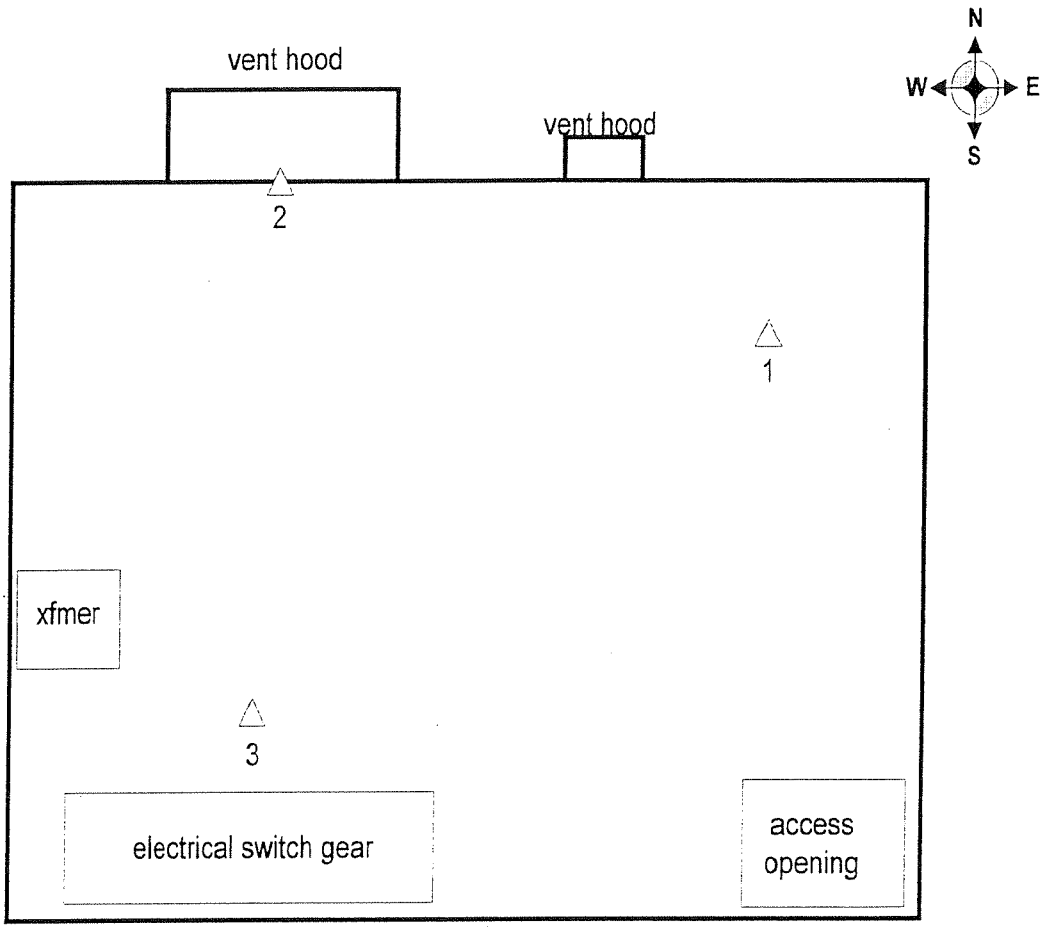

Figure 2:
Ventilation Equipment Room
above the Gamma Irradiation Facility Gallery

△ Indicates contact measurement and swipe sampling location

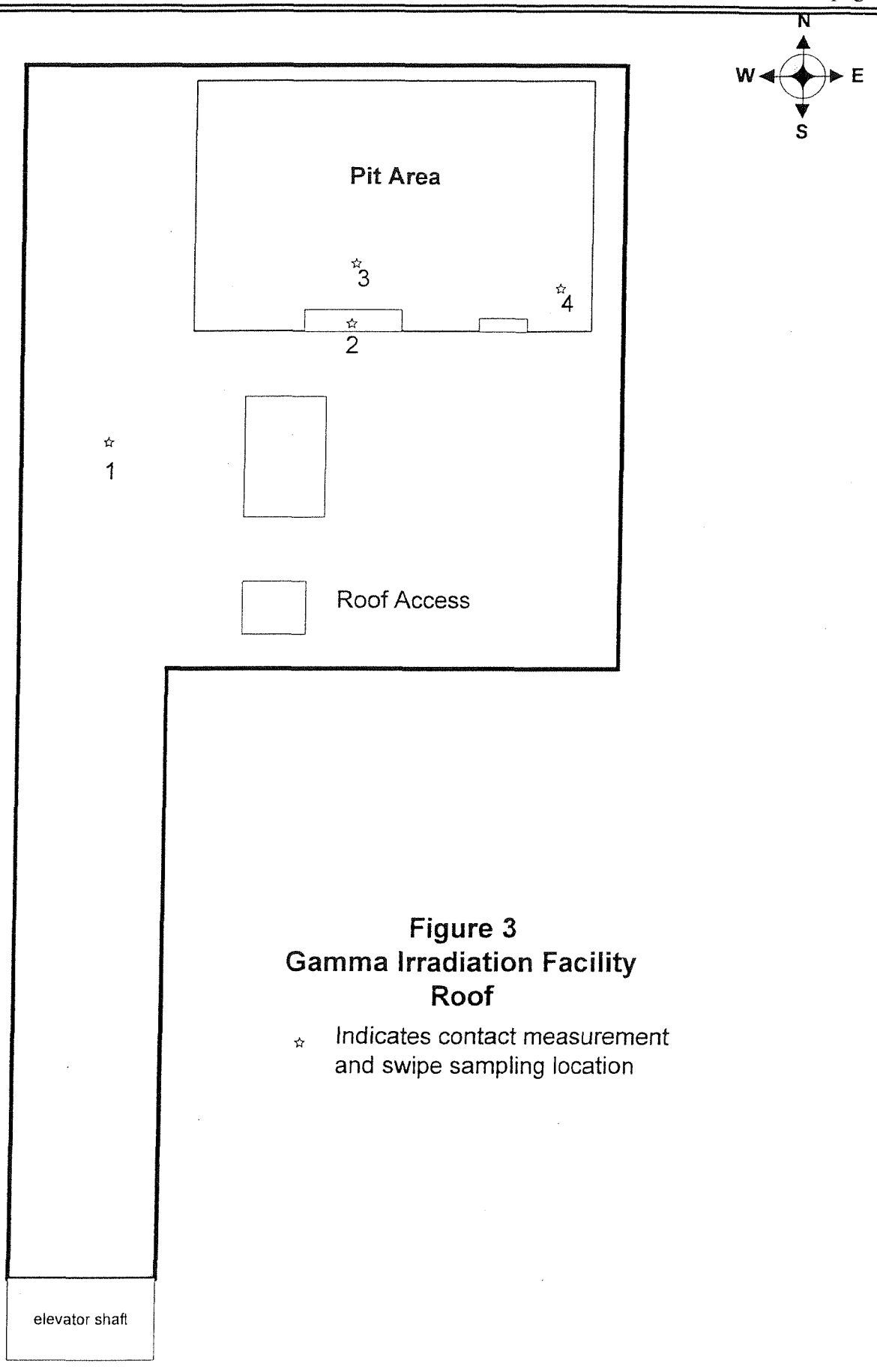

Figure 3
Gamma Irradiation Facility
Roof

☆ Indicates contact measurement and swipe sampling location

Table 1: Background Measurements:

Meter	open air measurement	concrete column located in unaffected office area	average bkgnd ± σ
Ludlum model 3 w/ 1x1 NaI gamma scintillator	2.5k – 3k cpm	3k cpm	2766 ± 188 cpm
Ludlum model 19 micro R exposure ratemeter	11 – 14 μR/hr	12 – 14 μR/hr	12.5 ± 1.1 μR/hr
Ludlum model 18 w/ 43-90 100cm^2 scintillator	0 cpm	0 cpm	0 cpm
Ludlum model 18 w/ 44-9 pancake GM	40 – 60 cpm	40 – 60 cpm	50 ± 8 cpm
Ludlum model 2221 w/ 2x2 NaI gamma scintillator	3928 cpm	4043 cpm	3985.5 ± 57.5 cpm
Eberline ESP-2 w/ 44-9 pancake GM	53.8 cpm	52.8 cpm	53.3 ± 0.5 cpm

Table 2: General Scan Survey Data (gross measurements):

GIF Area	Pancake GM	1X1 NaI	Exposure Rate
Gamma Cell	40 - 60 cpm	walls 2000 - 3700 cpm floor 3300 - 3400 cpm	15 - 18 μR/hr
Gallery	40 - 60 cpm	walls 2500 - 3700 cpm floor 3000 - 3500 cpm	15 - 17 μR/hr
Equipment Room	40 - 60 cpm	3000 cpm	10 - 12 μR/hr
Roof	40 - 60 cpm	1500 - 2500 cpm	8 - 9 μR/hr
Pit Area	40 - 60 cpm	1500 - 2500 cpm	13 - 15 μR/hr

Table 3: Contact Survey Data (gross measurements):

Location and Swipe ID	Alpha cpm (model - 18 w/ 43 - 90)	Beta cpm (ESP-2 w/44 - 9 G-M)	Gamma cpm (Ludlum 2221 w/44-10)	μR/hr (Ludlum M-19)
Gamma Cell 1	2	78.8	4750	13
Gamma Cell 2	1	83.7	4356	13
Gamma Cell 3	4	60.8	4699	14.5
Gamma Cell 4	2	87.7	4807	14
Gamma Cell 5	3	55.8	4226	13
Gamma Cell 6	4	53.8	4455	13
Gamma Cell 7	3	49.8	1938	5.5
Gamma Cell 8	0	45.9	4408	11.5
Gallery 1	4	70.8	4239	13
Gallery 2	3	60.8	4394	13
Gallery 3	10	84.7	4245	13
Gallery 4	5	72.8	4329	13
Gallery 5	4	73.8	4446	13
Equip Rm. 1	4	75.8	4124	12
Equip Rm. 2	1	82.7	3984	12
Equip Rm. 3	4	77.8	3891	10.5
GIF Roof 1	7	46.9	1791	6
GIF Roof 2	16	50.8	3257	10
GIF Roof 3	2	53.8	3398	11
GIF Roof 4	5	66.8	3821	12.5

Table 4: Swipe Sample Net Measurements and Laboratory Results:

Location and Swipe ID	Net Alpha dpm/100cm^2 (m-18 w/ 43-90)	Net Beta dpm/100cm^2 (ESP-2 w/44-9)	Laboratory Results for Removable		
			Gross Alpha dpm/100cm^2	Gross Beta dpm/100cm^2	Gamma dpm/100cm^2
Gamma Cell 1	11	1042	0.53±0.44	1.40±0.75	N.D.
Gamma Cell 2	5	1246	N.D.	N.D.	N.D.
Gamma Cell 3	21	292	0.58±0.44	N.D.	N.D.
Gamma Cell 4	11	1413	N.D.	N.D.	N.D.
Gamma Cell 5	16	83	N.D.	N.D.	N.D.
Gamma Cell 6	21	0	0.53±0.44	N.D.	N.D.
Gamma Cell 7	16	-167	N.D.	N.D.	N.D.
Gamma Cell 8	0	-329	N.D.	N.D.	N.D.
Gallery 1	21	708	0.38±0.24	N.D.	N.D.
Gallery 2	16	292	0.56±0.29	N.D.	N.D.
Gallery 3	53	1288	0.27±0.22	N.D.	N.D.
Gallery 4	26	792	0.56±0.29	N.D.	N.D.
Gallery 5	21	833	0.29±0.22	N.D.	N.D.
Equip Rm. 1	21	917	0.62±0.36	1.51±0.69	N.D.
Equip Rm. 2	5	1204	0.38±0.29	N.D.	N.D.
Equip Rm. 3	21	1000	0.89±0.40	1.33±0.69	N.D.
GIF Roof 1	37	-288	N.D.	2.00±0.60	N.D.
GIF Roof 2	84	-125	0.78±0.53	1.35±0.71	N.D.
GIF Roof 3	11	0	N.D.	2.35±0.78	N.D.
GIF Roof 4	26	542	1.47±0.62	2.44±0.78	N.D.

- Negative values indicate calculated numbers associated with measured levels that are below the background levels for the site.
- Results less than the lower limit of detection of the Laboratory are reported as not detected (N.D.) by the SRLB.

Summary:

The Gamma Irradiation Facility (GIF) at Rocketdyne DeSoto in Canoga Park, CA., was scanned for radioactive contamination. All areas of the GIF were found to have levels near the background levels established for the survey. The results of the contact measurements and the laboratory analysis of the samples collected for the GIF have activity levels below the acceptable surface contamination levels listed in DECON-1 (Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use).

Prepared by: Roger K Kryo Date: July 14, 1999