



GO NO. 96180	S/A NO.	PAGE 1 OF 46	TOTAL PAGES 46	REV LTR/CHG NO SEE SUMMARY OF CHG NEW	NUMBER N001SRR140103
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PROGRAM TITLE
Radiation and Nuclear Safety

DOCUMENT TITLE
Radiological Survey Results following Decontamination of DeSoto Building 104, First Floor

DOCUMENT TYPE Safety Review Report	KEY NOUNS Decommissioning, Surveys
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ORIGINAL ISSUE DATE	REL. DATE 8-17-88 SW	APPROVALS R. L. Gay R L Gay R. J. Tuttle	DATE 8/9/88
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PREPARED BY/DATE V. A. Swanson V. Swanson 8/9/88	DEPT 635	MAIL ADDR T006	APPROVALS R. J. Tuttle 8/9/88
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ABSTRACT
The first floor of Building 104 at DeSoto has been cleaned out and decontaminated in preparation for demolition and renovation. This report gives the results of the radiological surveys that were conducted.

The results show that all areas, except for the industrial waste drains and those areas not being demolished, were either clean or were decontaminated so that demolition may proceed and all debris may be disposed of as conventional waste.

The final radiological survey of the library books was performed at this time. The final survey of the remainder of the first floor will be done following the demolition phase.

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1. INTRODUCTION

The first floor of DeSoto Building 104, with the exception of the Gamma Irradiation Facility (GIF) and the Applied Nuclear Research laboratories (Rooms 411-72, 411-76, 413-69, 413-75, 413-77, 413-81, 41M-11, and 41M-11A) has been cleaned out for renovation as laboratories and offices. The goal was to detect and remove all radioactivity during this cleanout phase so that all remaining materials may be removed and disposed of as conventional waste during the following demolition phase. All radioactively contaminated materials and equipment detected during the cleanout phase were disposed of as radioactive waste.

The cleanout phase was performed by the Nuclear Operations group and the radiation surveys were performed by the Radiation and Nuclear Safety group using the following Supporting Documents:

"Decontamination Plan for Building 104, 1st Floor",
N001TI300280

"Radioactive Exhaust Systems Removal Detailed Work
Procedure", N001DWP000014

"Facility Structural Surfaces Decontamination",
N001DWP000015

"Radiological Survey and Decontamination Plan -
Industrial Waste and Cooling Water Return Drain Systems -
Building 104", N001TI000281 Rev A

"Radiological Surveys for Cleanout of First Floor,
DeSoto Building 104", N001SRR140102

This report gives the results of the radiation surveys that were performed during and following the cleanout phase. A final acceptance survey will be performed following the conclusion of the demolition phase.

2. CLASSIFICATION OF ROOMS

The areas in Building 104 have been identified on the basis of historical use as "clean" (areas in which radioactive materials were not used, such as the library), "suspect" (areas in which radioactive materials might have been used occasionally), and as "contaminated" (areas where radioactive material was routinely used). These were color-coded yellow, orange and red respectively on floor plan maps. If surveys found any detectable radioactivity in an area that had been classified as yellow or orange, it was upgraded to a red area.

Tables 1-3 are lists of rooms by classification as determined prior to the cleanout phase with notations for rooms that were upgraded to red. Figure 1 is a floor plan of the first floor of Building 104.

3. SURVEY PLAN

Table 4 is a summary of the area cleaning and survey guidelines. The surveys specified consisted of portable instrument surveys only, using alpha-scintillation and thin-window pancake GM probes with count-rate meters. Any radioactivity detected was identified, removed and disposed of as radioactive waste until no detectable radioactivity remained.

It was recognized that there would be places where it was not possible to exactly comply with the specified survey guidelines. Any such deviations were documented on the survey forms.

In addition to the area surveys, all industrial waste and cooling water return drains were surveyed. The surveys consisted of gamma spectroscopy measurements of sediment or crud removed from the drains and of sediment and water from the industrial waste settling tank. In most cases, measurements of fixed contamination were also made at drain entrances, to the extent possible, using pancake GM and alpha scintillation detectors. Smears were taken in some instances. Gamma spectroscopy measurements were also made on water samples drained from the cooling water supply lines.

Library books and reports were surveyed by use of alpha, beta and gamma count-rate instruments on a uniform 5% sample. Twice this sample was used in those categories of interest to researchers in radioactivity such as nuclear physics and radiochemistry. Both front and back covers were surveyed. One page per 100 of every fifth book was also surveyed. Books surveyed were listed by complete call number on the survey forms. Any books with detectable radioactivity were to be set aside for cleaning or disposal.

4. SURVEY RESULTS

4.1 Yellow Areas

Table 5 gives a summary of the survey results for the yellow areas. Only one of the rooms, 413-32, was found to contain radioactivity and was upgraded to a red area. There were 111 areas confirmed as yellow areas, with no detectable radioactivity.

TABLE 1.
LISTING OF YELLOW AREAS

41A-18	413-10	416-01
-22	-11	-08
-26	-12	-14 *
-26A	-14	-14PAD
-28	-16	-22
-28A	-18	-24
-40	-19	-26
41D-06	-20	-30
-06A	-22	-34
-06D	-22A	-36
41M-07	-23	-38
-09	-28	-42
-17	-28A	-46
-19	-30	-50
-23	-32 -UPGRADED TO RED	-54
-23A	-34	-58
-35	-36	-62
-35A	-38	-64
-40	-40	-68
411-25	-42	-70
-29	-46	-72
-31	414-07	-78
-33	-11	-85
-34	-13	41A HALL
-34A	-15	41D HALL
-35	-17	41G HALL
-39	-19	41M HALL
-43	-21	411 HALL
-43A	-23	413 HALL
-45	-25	414 HALL
-47	-29	416 HALL
-49	-31	SUPPLY DOCK
-51	-35	
-53	-37	
-57	-41	
-61	-51	
-63	-53	
-65		
-69		
-73		
-81		
-81A		
-81B		

* 1/2 OF FLOOR SURVEYED PER RED REQUIREMENTS.

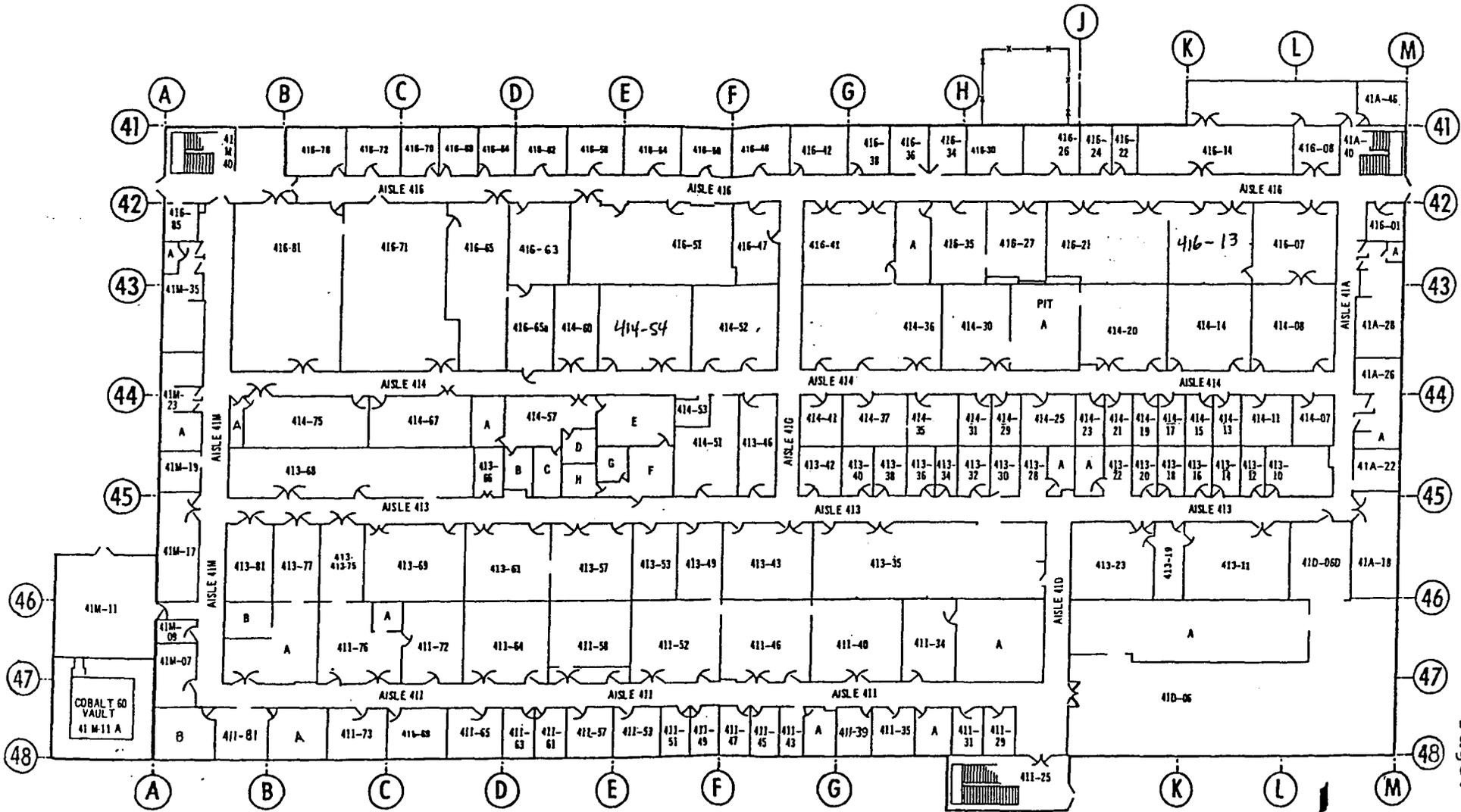
TABLE 2.

LISTING OF ORANGE AREAS

41A-46	
41M-11	
411-40	UPGRADED TO RED AREA
-46	
-52	
-58	
-64	UPGRADED TO RED AREA
413-35	"
-43	"
-49	"
-53	"
-68	"
414-75	"

TABLE 3.
LISTING OF RED AREAS

41M-11A	414-52
411-40	-54
-64	-57
-72	-57A
-76	-57B
-76A	-57C
413-32	-57D
-35	-57E
-43	-57F
-49	-57G
-53	-57H
-57	-60
-61	-67
-66	-75
-68	416-07
-69	-13
-75	-21
-77	-27
-77A	-35
-77B	-35A
-81	-41
414-08	-51
-14	-63
-20	-65
-30	-65A
-30A	-71
-36	-81



DESOTO FACILITY
 BLDG. 004
 LABORATORY BLDG. (1st FLOOR)
 54,500 sq ft



FIGURE 1.
 FLOOR PLAN
 BUILDING 104, FIRST FLOOR

TABLE 4.

AREA SURVEY GUIDELINES

AREA TYPE	COLOR CODE	NUMBER OF AREAS	<--- REMOVE AND SURVEY --->					<----- SURVEY ----->				
			WIPE HORIZ SURFACES	BASE BOARD	FLOOR TILES	WALLS & CEILING	VACUUM	EQUIP & HARDWARE	HORIZ SURFACES	BASE BD & FLOOR	WALLS & CEILING	
CLEAN	YELLOW	111	---	10%	10%	---	AS NEEDED	100%	---	10%	10%	10% LOWER 1 METER WALL
SUSPECT	ORANGE	4	100%	100%	10%	5%	AS NEEDED	100%	100%	10%	10%	5%
CONTAMI- NATED	RED	54	100%	100%	100%	10%	100% FLOOR & COVE. REST AS NEEDED	100%	100%	20%	20%	10%

NOTE: Sample areas selected at random, except for areas of suspected contamination that were deliberately selected.

TABLE 5

SURVEY SUMMARY - YELLOW AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR* TILES REMOVED SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE* BOARD REMOVED SURVEYED	HORIZ SURFACE LOCATIONS SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% LOWER 1-METER WALL SURVEYED	NO. OF FURNITURE ITEMS SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
41A-18	12.0	30.0	13.0	10	NO TILES ** 6.3% FLOOR	N/A	N/A	YES	21	8% + XFMR AIR VENTS	N/A	YES	NDA
41A-22	12.0	7.2	8.5	4	10.0	4	15.6	YES	12	10.4	2	YES	NDA
41A-26	17.0	10.5	8.0	8	10.7	6	10.9	YES	16	9.7	19	YES	NDA
41A-26A	12.0	6.5	8.0	4	10.0	4	12.5	YES	10	9.0	3	N/A	NDA
41A-28	20.0	10.5	8.0	14	12.7	7	10.0	YES	24	10.0	23	YES	NDA
	7.0	7.0	8.0										
41A-28A	7.0	5.0	12.0	4	NO TILES 11% FLOOR	5	N/A	YES	7	10.0	5	YES	NDA
41A-40	17.5	18.0		14	9.7	7	14.8	YES	21	10.1	N/A	N/A	NDA
41D-06	14.0	20.0	8.5	111	10.0	25	14.6	YES	77	10.0	29	YES	NDA
	90.0	24.0	8.5										
41D-06A	12.0	19.0	8.5	44	10.0	20	17.5	YES	55	10.7	21	YES	NDA
	15.0	48.0	8.5										
41D-06D	21.0	14.0	8.5	16	10.0	4	11.5	YES	21	10.0	8	YES	NDA
41M-07	11.0	15.0	8.5	8	10.2	6	17.3	YES	18	11.5	10	YES	NDA
41M-09	11.0	7.5	8.5	4	10.7	4	16.2	YES	14	12.6	4	YES	NDA
41M-17	12.0	32.0	12.0	11	NO TILES ** 10% FLOOR	N/A	N/A	YES	20	15.2	N/A	YES	NDA
41M-19	12.0	6.0	8.5	4	10.7	4	16.7	YES	12	11.1	5	YES	NDA
41M-23/23A	12.0	23.0	8.5	13	10.0	10	21.4	YES	27	12.9	3	YES	NDA
41M-35	10.5	16.5	8.5	10	10.0	10	27.8	YES	20	12.3	N/A	YES	NDA
41M-35A	7.0	5.0	12.0	4	NO TILES 11% FLOOR	8	16.7	YES	8	11.1	3	N/A	NDA
(CLOSET)													
41M-35A	9.0	6.5	6.5	6	NO TILES 10% FLOOR	10	16.1	YES	10	10.8	3	N/A	NDA
(ELEV PIT)													
41M-40	19.0	20.3		16	10.2	8	15.2	YES	24	13.7	N/A	N/A	NDA
411-25 IN	18.0	14.0	8.5	11	10.0	6	14.1	YES	20	10.4	N/A	N/A	NDA
411-25 OUT	12.5	13.0		7	10.0	5	14.7	YES	15	9.8	N/A	N/A	NDA
411-29	12.0	7.5	8.5	4	10.4	4	12.8	YES	14	12.0	7	YES	NDA

* TILES, BASE BOARDS & UNDERLYING SURFACES SURVEYED

** NO. OF LOCATIONS SURVEYED NOT GIVEN ON SURVEY FORM OR N/A

TABLE 5 CONTINUED

SURVEY SUMMARY - YELLOW AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR* TILES REMOVED SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE* BOARD REMOVED SURVEYED	HORIZ SURFACE LOCATIONS SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% LOWER 1-METER WALL SURVEYED	NO. OF FURNITURE ITEMS SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
411-31	12.0	7.5	8.5	4	10.4	4	12.8	YES	14	12.0	8	YES	NDA
411-33	12.0	10.0	8.5	6	10.1	4	9.1	YES	14	10.6	3	YES	NDA
411-34	21.0	14.5	8.5	13	9.9	7	14.8	YES	21	9.9	5	YES	NDA
411-34A	20.5	21.5	13.0	19	10.1	**	N/A	YES	25	9.9	2	N/A	NDA
411-35	12.0	9.5	8.5	5	10.0	4	11.6	YES	14	10.8	9	YES	NDA
411-39	12.0	10.0	8.5	5	10.1	4	13.6	YES	14	10.6	16	YES	NDA
411-43	12.0	6.0	8.5	3	10.2	3	13.9	YES	11	10.2	4	YES	NDA
411-43A	12.0	8.5	8.5	4	10.2	4	12.2	YES	14	11.4	8	YES	NDA
411-45	12.0	7.0	8.5	4	10.0	4	13.2	YES	12	10.5	9	N/A	NDA
411-47	12.0	7.0	8.5	4	10.0	4	13.2	YES	15	13.2	6	YES	NDA
411-49	12.0	7.0	8.5	4	10.0	4	10.5	YES	15	13.2	4	YES	NDA
411-51	12.0	7.0	8.5	4	10.0	4	13.2	YES	14	12.3	5	YES	NDA
411-53	12.0	14.5	8.5	8	10.0	6	17.0	YES	18	11.3	6	YES	NDA
411-57	12.0	14.5	8.5	8	10.0	6	17.0	YES	18	11.3	9	YES	NDA
411-61	12.0	7.5	8.5	4	10.7	4	10.3	YES	14	12.0	7	YES	NDA
411-63	12.0	7.2	8.5	4	10.7	4	10.4	YES	14	12.1	2	YES	NDA
411-65	12.0	15.0	8.5	8	9.9	6	16.7	YES	18	11.1	7	YES	NDA
411-69	12.0	15.0	8.5	8	9.9	6	16.7	YES	18	11.1	8	YES	NDA
411-73	12.0	15.0	8.5	8	9.9	6	16.7	YES	18	11.1	10	YES	NDA
411-81	12.0	15.3	8.5	8	10.0	6	16.7	YES	18	11.1	12	YES	NDA
411-81A	12.0	14.5	8.5	8	10.8	6	17.0	YES	18	11.3	10	YES	NDA
411-81B	12.0	14.5	8.5	8	10.8	6	17.0	YES	18	11.3	13	YES	NDA
413-10	12.5	18.5	8.5	10	10.0	6	14.5	YES	18	9.7	14	YES	NDA
413-11	20.5	29.2	8.5	24	10.0	10	15.0	YES	30	10.0	22	YES	NDA
413-12	12.0	7.0	8.5	4	10.0	4	15.8	YES	12	10.5	4	YES	NDA
413-14	12.5	7.2	8.5	4	10.0	4	15.0	YES	12	10.0	8	YES	NDA
413-16	12.5	7.2	8.5	4	10.0	4	15.0	YES	12	10.0	4	YES	NDA
413-18	13.0	7.2	8.5	4	10.0	4	15.0	YES	12	10.0	4	YES	NDA
413-19	6.0	8.0	13.0	2	10.0	2	10.7	YES	8	9.5	1	YES	NDA
413-20/22	12.5	13.3	8.5	7	10.2	5	14.4	YES	16	10.3	8	YES	NDA

* TILES, BASE BOARDS & UNDERLYING SURFACES SURVEYED

** NO. OF LOCATIONS SURVEYED NOT GIVEN ON SURVEY FORM OR N/A

TABLE 5 CONTINUED

SURVEY SUMMARY - YELLOW AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR* TILES REMOVED SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE* BOARD REMOVED SURVEYED	HORIZ SURFACE LOCATIONS SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% LOWER 1-METER WALL SURVEYED	NO. OF FURNITURE ITEMS SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
413-22A	12.5	9.0	8.5	5	10.4	4	14.0	YES	14	10.9	5	YES	NDA
413-23	20.5	23.0	13.0	20	9.9	8	13.8	YES	26	10.0	4	YES	NDA
413-28	12.5	6.0	9.0	3	10.7	3	9.7	N/A	10	10.8	N/A	YES	NDA
413-28A	11.0	9.0	8.5	5	10.6	4	15.0	YES	12	10.0	8	YES	NDA
413-30	12.5	7.0	9.0	4	10.7	4	10.3	YES	12	10.3	7	YES	NDA
413-32	UPGRADED TO RED AREA												
413-34	12.5	7.0	9.0	4	10.7	4	10.3	YES	12	10.3	5	YES	NDA
413-36	12.0	7.2	8.5	4	10.3	4	15.6	YES	12	10.4	7	YES	NDA
413-38	12.5	7.0	9.0	4	10.7	4	10.3	YES	12	10.3	4	YES	NDA
413-40	12.5	7.0	9.0	4	10.7	4	10.3	YES	12	10.3	9	YES	NDA
413-42	12.5	12.0	9.0	6	10.0	4	8.2	YES	16	10.9	12	YES	NDA
413-46	25.0	8.5	13.0	9	NO TILES	**	N/A	YES	20	10.0	3	N/A	NDA
					9.5% FLOOR								
414-07	12.5	11.0	8.5	6	10.7	5	11.2	YES	14	9.9	11	YES	NDA
414-11	13.0	15.0	8.5	8	10.0	6	16.1	YES	18	10.7	1	YES	NDA
414-13	13.0	7.2	8.5	4	11.1	4	14.8	YES	12	9.9	1	YES	NDA
414-15	13.0	7.2	8.5	4	11.1	4	14.8	YES	12	9.9	5	YES	NDA
414-17	12.5	7.0	9.0	4	10.7	12	15.4	YES	12	10.3	4	YES	NDA
414-19	12.5	7.0	9.0	4	10.7	12	15.4	YES	12	10.3	1	YES	NDA
414-21	12.5	7.0	9.0	4	10.7	12	15.4	YES	12	10.3	7	YES	NDA
414-23	12.5	7.0	9.0	4	10.7	12	15.4	YES	12	10.3	5	YES	NDA
414-25	12.5	15.0	9.0	9	10.9	24	21.8	YES	18	10.9	7	YES	NDA
414-29	13.0	7.2	8.5	4	10.7	**	100.0	YES	12	9.9	1	YES	NDA
414-31	12.5	7.0	9.0	4	10.7	10	12.8	YES	12	10.3	6	YES	NDA
414-35	12.5	15.0	9.0	9	10.9	14	12.7	YES	18	10.9	19	YES	NDA
414-37	13.0	15.0	8.8	8	10.0	**	100.0	YES	18	10.7	4	YES	NDA
414-41	12.0	12.0	8.5	6	9.8	**	100.0	YES	16	11.1	11	YES	NDA
414-51	14.0	17.5	13.0	10	NO TILES	**	N/A	YES	20	10.6	N/A	YES	NDA
					9.2% FLOOR								
414-53	8.0	11.0	13.0	4	11.6	4	16.7	YES	12	11.1	N/A	YES	NDA

* TILES, BASE BOARDS & UNDERLYING SURFACES SURVEYED

** NO. OF LOCATIONS SURVEYED NOT GIVEN ON SURVEY FORM OR N/A

TABLE 5 CONTINUED

SURVEY SUMMARY - YELLOW AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR* TILES REMOVED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE* BOARD REMOVED	HORIZ SURFACE LOCATIONS SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% LOWER 1-METER WALL SURVEYED	NO. OF FURNITURE ITEMS SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
416-01	9.0	9.5	13.0	4	NO TILES ** 11% FLOOR	**	N/A	YES	10	10.5	N/A	YES	NDA
416-08	12.0	12.0		6	9.8	5	15.6	YES	15	10.4	3	YES	NDA
416-14	12.0	44.5	13.5	34	10.1 WEST 20.0 EAST	11	14.6	YES	44	13.0	11	N/A	NDA
416-14 PATIO	38.0	12.0	OPEN	14	NO TILES ** 12% FLOOR	**	N/A	N/A		N/A	N/A	N/A	NDA
416-22	12.0	7.0	8.5	4	12.5	3	11.8	YES	12	10.5	1	YES	NDA
416-24	12.0	7.3	8.5	4	10.4	4	15.3	YES	12	10.3	5	YES	NDA
416-26	12.0	15.0	8.5	8	10.0	6	16.7	YES	18	11.1	14	YES	NDA
416-30	12.0	15.0	8.5	8	10.0	6	16.7	YES	18	11.1	11	YES	NDA
416-34	12.0	10.0	8.5	5	9.6	4	13.6	YES	14	10.6	8	YES	NDA
416-36	12.0	10.0	8.5	5	9.6	4	13.6	YES	14	10.6	7	YES	NDA
416-38	12.0	10.0	8.5	5	9.6	4	13.6	YES	15	11.4	3	YES	NDA
416-42	12.0	15.0	8.5	8	10.0	6	16.7	YES	18	11.1	10	YES	NDA
416-46	12.0	15.0	8.5	8	10.0	6	16.7	YES	18	11.1	10	YES	NDA
416-50	12.0	15.0	8.5	9	10.0	4	11.1	YES	17	10.5	4	YES	NDA
416-54	12.0	15.0	8.5	8	10.0	6	16.7	YES	18	11.1	10	YES	NDA
416-58	12.0	15.0	8.5	8	10.0	6	16.7	YES	18	11.1	7	YES	NDA
416-62	12.0	15.0	8.5	9	10.0	6	16.7	YES	18	11.1	8	YES	NDA
416-64	11.5	12.0	8.5	6	9.1	4	12.8	YES	15	10.6	6	YES	NDA
416-68	11.5	12.0	8.5	6	9.1	4	12.8	YES	15	10.6	6	YES	NDA
416-70	11.5	12.0	8.5	6	9.1	4	12.8	YES	15	10.6	5	YES	NDA
416-72	12.0	15.0	8.5	6	7.1	5	13.9	YES	17	10.5	7	YES	NDA
416-78	11.5	14.5	8.5	8	9.2	5	14.4	YES	16	10.3	6	YES	NDA
416-85 (ELEVATOR)	7.0	7.8	8.0	ALL	NO TILES ** 100 FLOOR	**	N/A	YES	ALL	100.0	N/A	YES	NDA
41A AISLE	73.5	6.0	8.5	20	9.9	14	14.3	YES	40	9.1	N/A	N/A	NDA
41D AISLE	42.0	6.0	8.5	11	9.8	7	12.5	YES	22	8.7	N/A	N/A	NDA
41G AISLE	67.5	6.0	8.5	18	10.0	13	14.4	YES	40	9.9	N/A	N/A	NDA

* TILES, BASE BOARDS & UNDERLYING SURFACES SURVEYED

** NO. OF LOCATIONS SURVEYED NOT GIVEN ON SURVEY FORM OR N/A

TABLE 5 CONTINUED

SURVEY SUMMARY - YELLOW AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR* TILES REMOVED SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE* BOARD REMOVED SURVEYED	HORIZ SURFACE LOCATIONS SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% LOWER 1-METER WALL SURVEYED	NO. OF FURNITURE ITEMS SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
41M AISLE	118.8	6.0	8.5	36	10.1	24	15.2	YES	73	10.2	N/A	N/A	NDA
411 AISLE	176.3	6.0	8.5	47	10.0	33	14.0	YES	107	10.1	N/A	N/A	NDA
413 AISLE	299.0	6.0	8.5	79	10.0	55	13.8	YES	174	9.7	N/A	N/A	NDA
414 AISLE	291.0	6.0	8.5	85	10.0	57	14.7	YES	174	10.0	N/A	N/A	NDA
416 AISLE	277.0	6.0	8.5	66	10.0	53	14.4	YES	166	10.0	N/A	N/A	NDA
SUPPLY DOCK	19.0	11.5	15.0	ALL	NO TILES	1	13.0	YES	44	9.8	N/A	N/A	NDA
						100 FLOOR							

* TILES, BASEBOARDS & UNDERLYING SURFACES SURVEYED

** NO. OF LOCATIONS SURVEYED NOT GIVEN ON SURVEY FORM OR N/A

4.2 Orange Areas

Table 6 gives a summary of the survey results for the orange areas. Room 41M-11 (the GIF operating gallery) is not included in the planned demolition work and was therefore not surveyed. Only the floor and baseboard in room 411-58 were surveyed to confirm a survey performed in 1984 which was a basis for releasing the room as clean under an NRC research reactor license (See Appendix). Eight rooms were upgraded to red because they were found to contain radioactivity.

4.3 Red Areas

Table 7 is a summary of the survey results for the red areas. In all cases where radioactivity was found, decontamination and more detailed surveys were performed until no further radioactivity was found. Rooms for which no furniture or equipment was surveyed either had none or they had been removed to a holding area for survey and were not identified as to which room they came from.

Figures 2-4 shows the preparation and survey of a typical red area.

4.4 Cooling Water Supply Lines

Table 8 is a summary of the survey results for the cooling water supply lines. Only one sample (CW-38) gave an indication of radioactivity and it was a factor of 350 below the MPC limit for Cs-137 as given in CAC17, Appendix A, Table II, Col. 2.

4.5 Cooling Water Return Drains

Table 9 is a summary of the survey results for the cooling water return drains. Only random drains were surveyed as called out in the procedure. No radioactivity was found in any of the drains surveyed. Figure 5 shows the layout of the cooling water return system and indicates the drains by sample location number.

4.6 Industrial Waste Return Drains

Table 10 is a summary of the survey results for the industrial waste return drains. An effort was made to survey all of the drain entrances. However, some drains are in rooms that are not scheduled for demolition, some were in use and could not be accessed and some were under carpeting in rooms which were coded yellow and were not expected to be contaminated. These cases are noted in the Table. Figure 6 shows the layout of the industrial waste drain system and indicates the drains by sample location number.

TABLE 6

SURVEY SUMMARY - ORANGE AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	HORIZ SURFACES SURVEYED	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR * SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE * BOARD SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% WALL REMOVED SURVEYED	NO. OF CEILING LOCATIONS SURVEYED	% CEILING REMOVED SURVEYED	NO. OF FURNITURE EQUIPMENT SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
41A-46	12.0	12.0	14.0	YES	4	11.0	8	33.3	8	4.0	2	5.6	12	N/A	NDA
BLOCK WALL															
41M-11 NOT INCLUDED IN PLANNED DEMOLITION WORK -- NOT SURVEYED															
411-40 UPGRADED TO RED AREA															
411-46	24.0	21.0	12.0	YES	23	10.3	18	10.0	13	5.4	7	12.5	33	YES	NDA
411-52	23.5	20.5	12.0	YES	17	10.0	16	9.1	12	5.4	3	6.8	0	N/A	NDA
411-58 FLOOR & BASEBOARD SURVEYED TO CONFIRM PRIOR RELEASE AS CLEAN IN 1984															
411-64 UPGRADED TO RED AREA															
413-35 UPGRADED TO RED AREA															
413-43 UPGRADED TO RED AREA															
413-49 UPGRADED TO RED AREA															
413-53 UPGRADED TO RED AREA															
413-68 UPGRADED TO RED AREA															
414-75 UPGRADED TO RED AREA															

* 100% OF FLOOR TILES REMOVED. TILES AND REMOVED BASE BOARD EITHER DISPOSED OF AS RADIOACTIVE MATERIAL OR SURVEYED TO DETERMINE DISPOSITION.

TABLE 7

SURVEY SUMMARY - RED AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	HORIZ SURFACES SURVEYED	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR * SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE * BOARD SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% WALL REMOVED SURVEYED	NO. OF CEILING LOCATIONS SURVEYED	% CEILING REMOVED SURVEYED	NO. OF FURNITURE EQUIPMENT SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
41M-11A	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED.										
411-40	21.0	20.0	12.0	YES	38	20.8	40	24.4	32	14.1	7	15.6	83	N/A	DECONNED FLOOR - NDA
411-64	20.8	24.0	12.0	YES	25	19.8	36	20.0	24	9.8	6	10.7	0	N/A	NDA
411-72	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
411-76	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
411-76A	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
413-32	12.5	7.0	9.0	YES	12	41.8	ALL	100.0	NO INFO	12.6	2	9.1	8	NDA	NDA
413-35	58.5	21.0	12.0	YES	89	20.4	64	20.1	33	9.5	16	10.3	35	NDA	DECONNED FLOOR - NDA
413-43	24.0	21.0	12.0	YES	13	20.6	NO INFO	20.0	17	10.4	6	10.7	62	NDA	DECONNED FLOOR - NDA
413-49	21.0	12.0	12.0	YES	9	21.6	8	56.1	12	10.8	3	10.8	42	N/A	NDA
413-53	21.0	12.0	13.0	YES	12	19.0	12	36.4	19	9.2	3	10.7	6	N/A	NDA
413-57	21.0	24.0	12.0	YES	23	20.5	17	37.8	25	10.2	6	10.7	10	N/A	DECONNED HORIZ SURFACES - NDA
413-61	21.0	24.0	12.0	YES	19	28.6	17	33.3	25	10.2	6	10.7	70	N/A	DECONNED FLOOR & HORIZ SURFACES - NDA
413-66	12.0	7.0	12.0	YES	5	21.4	10	47.3	12	10.5	3	10.7	19	N/A	NDA
413-68	63.5	13.0	12.5	YES	24	19.6	22	27.5	47	10.4	14	10.9	202	NDA	DECONNED WALL - NDA
413-69	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
413-75	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
413-77	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
413-77A	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
413-77B	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
413-81	NOT INCLUDED IN PLANNED DEMOLITION WORK				-- NOT SURVEYED										
414-08	23.0	21.0	12.0	YES	21	21.7	15	41.0	21	10.3	6	11.2	36	N/A	NDA
414-14	20.0	24.0	12.0	YES	20	20.8	16	35.2	25	10.1	6	11.3	14	NDA	NDA
414-20	20.0	24.0	12.0	YES	20	20.8	16	41.5	23	13.7	6	11.3	70	N/A	NDA
414-30	20.0	19.0	12.0	YES	18	18.9	15	38.5	22	10.5	4	9.5	116	NDA	DECONNED FLOOR - NDA
414-30A-1	20.3	9.0	7.0	YES	9	19.7	24	20.5	13	11.0	2	12.5	0	NDA	NDA
414-30A-2	17.0	9.0	6.0	YES	4	25.0	24	23.1	25	20.5		NO CEILING		NDA	NDA
414-30A-3	18.0	14.0	12.0	YES	8	19.8	12	20.0	21	10.1	4	14.3	0	NDA	NDA

* 100% OF FLOOR TILES REMOVED. TILES & REMOVED BASEBOARD EITHER DISPOSED OF AS RADIOACTIVE MATERIAL OR SURVEYED TO DETERMINE DISPOSITION

TABLE 7 CONTINUED

SURVEY SUMMARY - RED AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	HORIZ SURFACES SURVEYED	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR * SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE * BOARD REMOVED SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% WALL REMOVED SURVEYED	NO. OF CEILING LOCATIONS SURVEYED	% CEILING REMOVED SURVEYED	NO. OF FURNITURE EQUIPMENT SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
414-36	36.0	21.0	12.0	YES	31	20.5	23	40.4	34	10.7	9	10.7	0	NDA	NDA
414-52	20.5	23.0	12.0	YES	20	41.4	28	40.2	23	9.5	6	11.5	1	NDA	DECONNED FLOOR - NDA
414-54	20.5	23.0	12.0	YES	20	41.4	24	42.5	23	9.5	6	11.5	11	NDA	DECONNED FLOOR - NDA
414-57	24.0	12.8	9.0	YES	13	21.8	10	21.8	11	11.1	12	17.5	133	N/A	NDA
414-57A	13.0	9.0	12.0	YES	7	23.3	10	31.8	11	10.5	3	10.3	0	N/A	DECONNED FLOOR - NDA
414-57B	11.3	8.3	12.0	YES	5	21.8	6	26.9	11	11.2	3	12.9	0	N/A	NDA
414-57C	12.8	7.5	12.0	YES	5	23.0	16	46.9	12	9.8	5	20.4	0	N/A	NDA
414-57D	8.3	7.5	9.0	YES	4	21.8	10	46.0	7	11.3	4	25.8	0	N/A	NDA
414-57E	20.3	12.8	12.0	YES	12	21.3	16	34.8	14	10.7	7	11.0	0	N/A	NDA
414-57F	10.0	12.5	9.0	YES	9	20.6	17	25.4	11	10.5	7	16.0	0	N/A	NDA
414-57G	10.0	5.0	9.0												
414-57G	10.0	7.5	9.0	YES	5	21.3	11	35.7	8	12.3	3	16.0	0	N/A	NDA
414-57H	7.5	8.0	9.0	YES	4	20.0	8	32.3	8	13.2	4	26.7	0	N/A	NDA
414-60	21.0	12.8	12.0	YES	13	19.4	11	34.1	16	10.4	3	10.1	0	NDA	NDA
414-67	26.3	12.8	12.0	YES	14	21.1	12	30.8	18	10.1	4	10.9	0	N/A	DECONNED CEILING &
414-75	31.3	12.5	12.0	YES	16	20.3	NO INFO	20.0	23	10.2	5	11.4	16	NDA	DECONNED FLOOR - NDA
414-75A	9.0	4.0	12.0	YES	2	27.8	5	42.3	8	11.5	4	22.2	10	N/A	NDA
416-07	23.0	21.0	12.0	YES	21	21.7	15	37.5	24	10.3	6	11.2	35	N/A	NDA
416-13	21.0	24.0	12.0	YES	24	19.0	36	20.0	23	9.6	6	10.7	101 ITEMS	NDA	NDA
416-21	32.0	21.0	12.0	YES	34	20.2	20	37.7	29	9.9	8	10.7	SURVEYED,	NDA	NDA
416-27	20.0	15.0	12.0	YES	16	21.3	32	32.9	33	10.0	4	12.0	5 ROOMS	NDA	NDA
416-35	15.0	20.0	12.0	YES	11	21.7	12	34.3	18	10.0	4	12.0		N/A	DECONNED FLOOR - NDA
416-35A	20.0	8.5	12.0	YES	7	20.6	11	38.6	15	10.0	17	11.8		N/A	NDA
416-41	21.0	24.0	12.0	YES	20	19.8	17	37.8	25	9.9	9	10.7	76	NDA	DECONNED VENT PIPES - NDA
416-51	55.0	20.5	12.0	YES	20	20.4	44	34.8	35	10.1	13	10.4	304	?	DECONNED FLOOR - NDA
416-63	FLOOR AND BASEBOARD SURVEYED TO CONFIRM PRIOR RELEASE AS CLEAN IN 1978														
416-65	28.0	16.0	12.0	YES	28	18.9	46	26.1	31	10.4	7	10.6	52	N/A	DECONNED FLOOR - NDA
416-65A	13.5	11.5	12.0												
416-65A	20.5	11.0	12.0	YES	13	19.5	4	28.6	18	10.4	3	12.0	4	N/A	NDA

* 100% OF FLOOR TILES REMOVED. TILES & REMOVED BASEBOARD EITHER DISPOSED OF AS RADIOACTIVE MATERIAL OR SURVEYED TO DETERMINE DISPOSITION

TABLE 7 CONTINUED

SURVEY SUMMARY - RED AREAS

ROOM NO.	LENGTH-ft	WIDTH-ft	HEIGHT-ft	HORIZ SURFACES SURVEYED	NO. OF FLOOR LOCATIONS SURVEYED	% FLOOR * SURVEYED	NO. OF BASE BRD LOCATIONS SURVEYED	% BASE * BOARD REMOVED SURVEYED	NO. OF WALL LOCATIONS SURVEYED	% WALL REMOVED SURVEYED	NO. OF CEILING LOCATIONS SURVEYED	% CEILING REMOVED SURVEYED	NO. OF FURNITURE EQUIPMENT SURVEYED	RETURN A/C DUCT SURVEYED	RESULTS
416-71	26.0	29.0	12.0	YES	29	20.0	26	45.6	40	10.2	14	11.3	117	NDA	NDA
	28.0	13.0	12.0												
416-71PIT	20.0	9.0	6.0	YES	ALL	100.0	ALL	100.0	20	23.0	N/A	N/A	0	N/A	***
416-81	40.0	28.0	12.0	**	**	**	**	**	28	9.6		**	**	**	NDA

* 100% OF FLOOR TILES REMOVED. TILES & REMOVED BASEBOARD EITHER DISPOSED OF AS RADIOACTIVE MATERIAL OR SURVEYED TO DETERMINE DISPOSITION

** THIS ROOM SURVEYED AND RELEASED IN 1986. ONLY INSIDE OF WALLS SURVEYED. SEE APPENDIX A.

*** MAXIMUM ALPHA ACTIVITY WAS 420 DPM/CM2 WHICH IS BELOW THE LIMIT OF 5,000 DPM/CM2 FOR U-235. PIT WAS FILLED WITH GRAVEL AND SAND AND CAPPED WITH CONCRETE.



FIGURE 2.
RED ROOM
WALL SECTION REMOVAL

6BL22-11

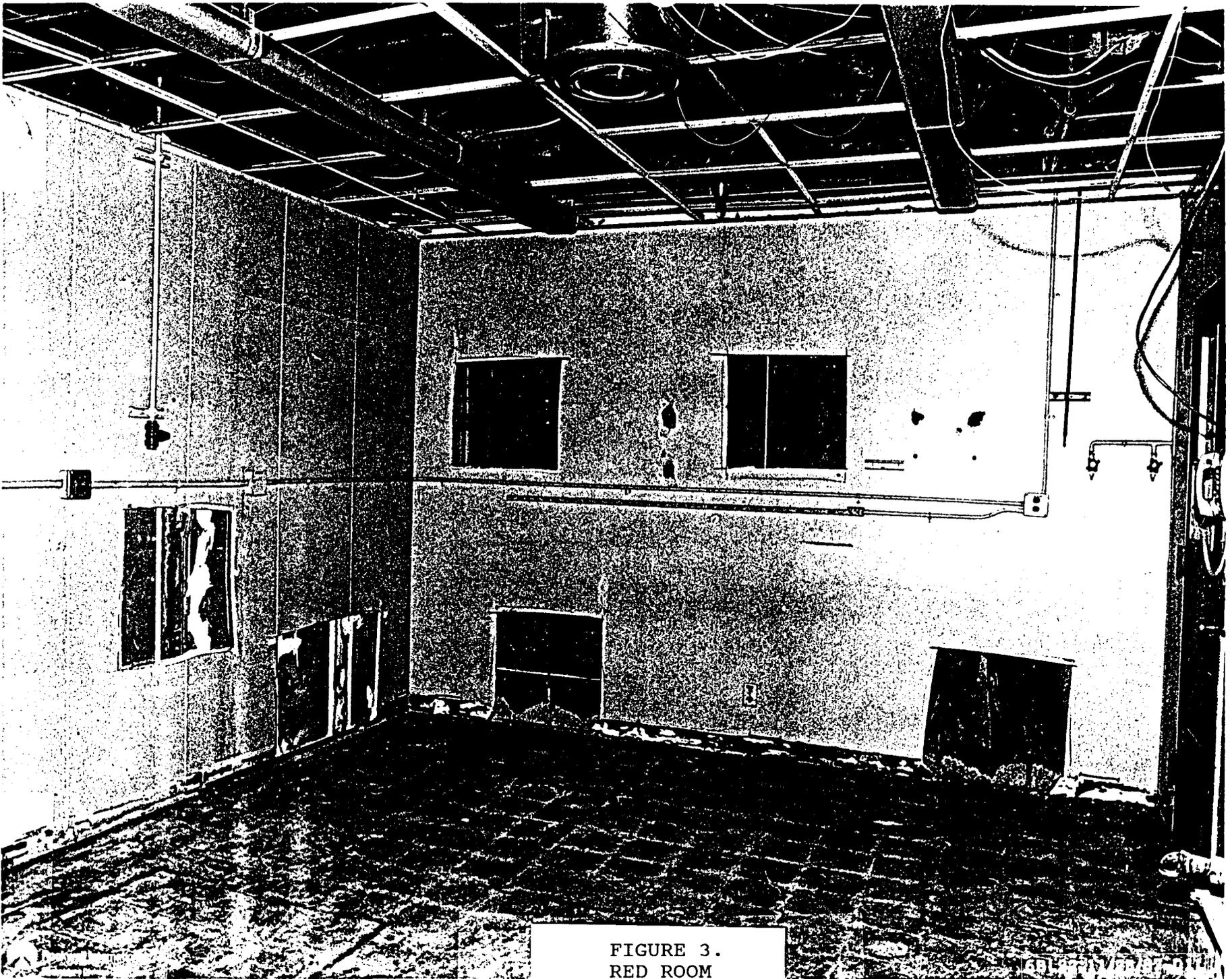


FIGURE 3.
RED ROOM
READY FOR SURVEY



FIGURE 4.
SURVEY OF RED ROOM

TABLE 8

SURVEY SUMMARY
COOLANT WATER SUPPLY LINES

SAMPLE No.	ROOM No.	SAMPLE VOLUME, ml	GAMMA ACTIVITY
CW-1	411-40	500	NDA
CW-2	411-40	500	NDA
CW-3	411-40	500	NDA
CW-4	411-40	500	NDA
CW-5	411-40	500	NDA
CW-6	411-46	475	NDA
CW-7	411-46	500	NDA
CW-8	411-46	500	NDA
CW-9	411-52	500	NDA
CW-10	411-52	500	NDA
CW-11	411-58	500	NDA
CW-12	411-58	500	NDA
CW-13	411-58	445	NDA
CW-14	411-58	500	NDA
CW-15	411-58	500	NDA
CW-16	411-58	500	NDA
CW-16A	413-61	500	NDA
CW-17	413-61	500	NDA
CW-18	413-61	500	NDA
CW-19	413-61	500	NDA
CW-20	413-61	NO WATER	IN LINE
CW-21	413-61	NO WATER	IN LINE
CW-22	413-57	500	NDA
CW-23	413-53	450	NDA
CW-24	413-53	500	NDA
CW-25	413-53	500	NDA
CW-26	413-53	500	NDA
CW-27	413-49	500	NDA
CW-28	413-43	500	NDA
CW-29	413-43	500	NDA
CW-30	413-43	500	NDA
CW-31	413-43	500	NDA
CW-32	413-43	500	NDA
CW-33	413-43	500	NDA
CW-34	413-43	500	NDA
CW-35	414-08	125	NDA
CW-36	414-08	220	NDA
CW-37	414-08	500	NDA
CW-38	414-08	500	Cs-137, 5.6x10 ⁻⁸ uCi/ml
CW-39	414-08	285	NDA
CW-40	414-14	500	NDA
CW-41	414-14	500	NDA
CW-42	414-14	500	NDA
CW-43	414-14	500	NDA
CW-44	414-14	500	NDA
CW-45	414-20	500	NDA
CW-46	414-20	325	NDA
CW-47	414-56	370	NDA

TABLE 8 CONTINUED

SURVEY SUMMARY
COOLANT WATER SUPPLY LINES

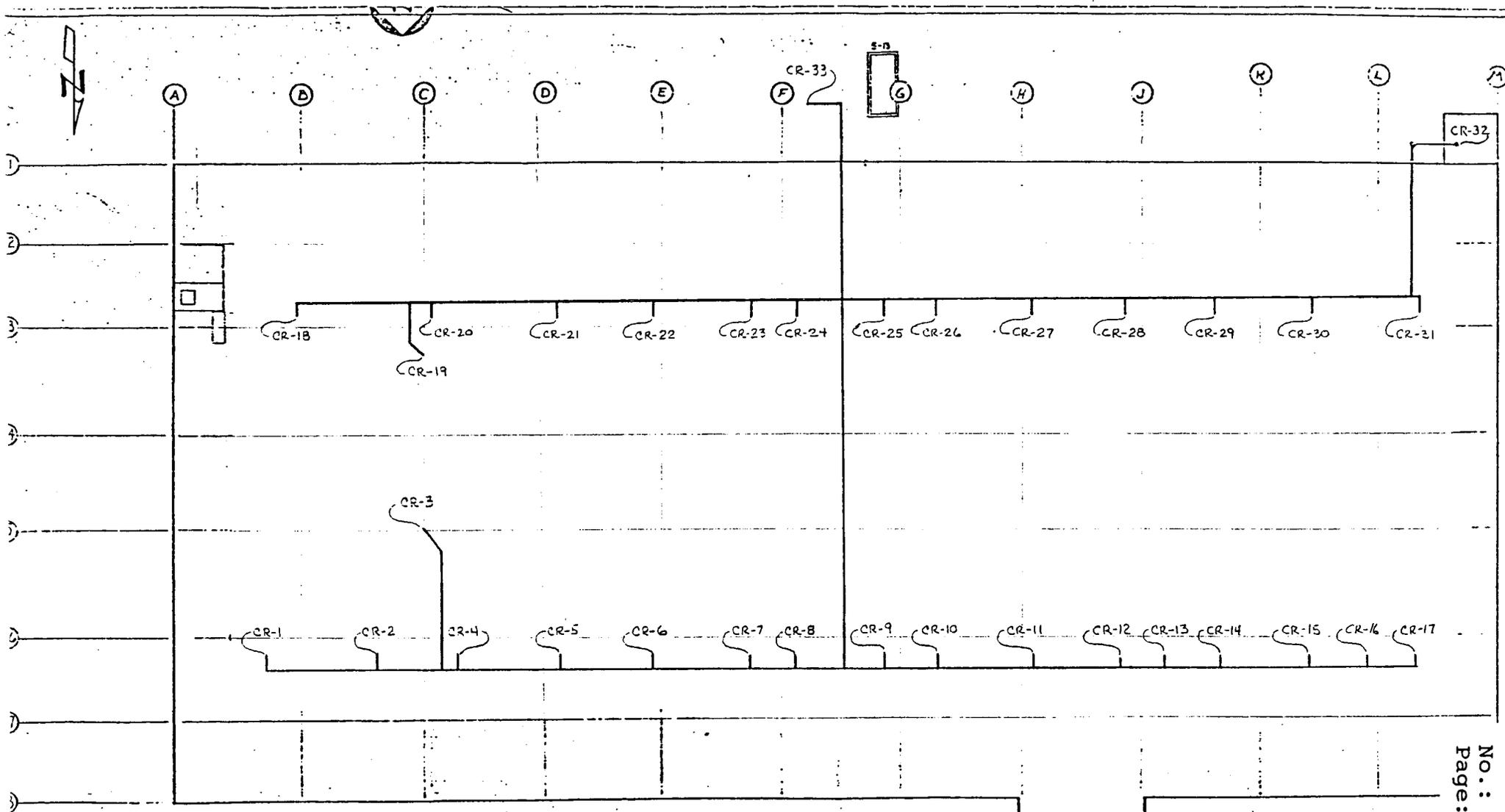
SAMPLE No.	ROOM No.	SAMPLE VOLUME, ml	GAMMA ACTIVITY
CW-48	414-56	500	NDA
CW-49	414-52	465	NDA
CW-50	414-52	460	NDA
CW-51	414-52	470	NDA
CW-52	414-60	500	NDA
CW-53	414-60	500	NDA
CW-54	414-65A	500	NDA
CW-55	414-65A	NO WATER	IN LINE
CW-56	414-65A	NO WATER	IN LINE
CW-57	414-65A	500	NDA
CW-58	416-71	500	NDA
CW-59	416-71	500	NDA
CW-60	411-64	500	NDA
CW-61	411-64	500	NDA
CW-62	411-64	500	NDA
CW-63	414-30	500	NDA
CW-64	414-30	500	NDA
CW-65	414-30	500	NDA
CW-66	414-30	500	NDA

TABLE 9

SURVEY SUMMARY
COOLANT WATER RETURN DRAINS

SAMPLE * LOCATION	REMOVABLE SAMPLE			DIRECT	
	SAMPLE TYPE	MASS, g	GAMMA ACTIVITY	ALPHA	BETA GAMMA
CR-5	SOLID	9	NDA	NDA	NDA
CR-7	SOLID	19	NDA	NDA	NDA
CR-8	SOLID	6	NDA	NDA	NDA
CR-9	SOLID	14	NDA		
CR-10A	SOLID	17	NDA		
CR-14	SOLID	19	NDA		
CR-15	SOLID	11	NDA		
CR-18	SOLID	38	NDA	NDA	NDA
CR-21	SOLID	9	NDA	NDA	NDA
CR-22	SOLID	53	NDA	NDA	NDA
CR-23	SOLID	9	NDA		
CR-24	SOLID	29	NDA	NDA	NDA
CR-25	SOLID	22	NDA	NDA	NDA
CR-28	SOLID	7	NDA		
CR-29	SOLID	5	NDA		
CR-30	SOLID	26	NDA	NDA	NDA

* SEE FIGURE 5



UNDERFLOOR PLAN
SCALE: 1/8" = 1'-0"

GROUND FLOOR DRAIN ENTRANCE LOCATIONS
COOLING WATER DRAIN SYSTEM - BLDG 004 - DESOTO FACILITY

FIGURE 5.
COOLING WATER RETURN
DRAIN LAYOUT

TABLE 10

SURVEY SUMMARY
INDUSTRIAL WASTE DRAINS

SAMPLE * LOCATION	SAMPLE TYPE	REMOVABLE SAMPLES		DIRECT		SMEAR	
		MASS, g	VOLUME, ml	GAMMA ACTIVITY	BETA ALPHA	BETA GAMMA	BETA GAMMA
IW-1	CURRENTLY USED IN AREA NOT SCHEDULED FOR DEMOLITION						
IW-2	CURRENTLY USED IN AREA NOT SCHEDULED FOR DEMOLITION						
IW-3	CURRENTLY USED IN AREA NOT SCHEDULED FOR DEMOLITION						
IW-4	CURRENTLY USED IN AREA NOT SCHEDULED FOR DEMOLITION						
IW-5	CURRENTLY USED IN AREA NOT SCHEDULED FOR DEMOLITION						
IW-6	SOLID	18		NDA			
IW-7	SOLID	10		U	NDA	2800 DPM	23 DPM NDA
IW-8	SOLID	55		NDA	NDA	1680 DPM	15 DPM NDA
IW-9	SOLID	8		NDA	NDA	NDA	
IW-10	SOLID	9		NDA	NDA	NDA	
IW-11	SOLID	17		U	NDA	2240 DPM	NDA NDA
IW-12	SOLID	28		U, Cs	NDA	2240 DPM	NDA NDA
IW-13	SOLID	38		U	NDA	2240 DPM	NDA NDA
IW-13A	SOLID	25		U	NDA	2240 DPM	NDA NDA
IW-14	SOLID	?		U, Cs	NDA	2240 DPM	NDA NDA
IW-14A					60 CPM	NDA	
IW-14B					NDA	NDA	NDA NDA
IW-15	SOLID	14		U	NDA	2800 DPM	NDA NDA
IW-16	SOLID	21		NDA	NDA	NDA	
IW-17	SOLID	28		U, Cs	NDA	8400 DPM	NDA NDA
IW-17A	SOLID	6		NDA	NDA	NDA	
IW-18	SOLID	3		NDA			
IW-18A	SOLID	5		NDA	NDA	NDA	
IW-19	IN LIBRARY, MAY BE IN USE, NOT SURVEYED						
IW-19A	IN LIBRARY, MAY BE IN USE, NOT SURVEYED						
IW-20	SOLID	7		NDA	NDA	NDA	
IW-21	SOLID	4 **		NDA	NDA	NDA	
IW-22	SOLID	39 **		NDA	50 CPM ?	NDA	
IW-23	SOLID	28		NDA			
IW-24	IN LIBRARY, CAPPED, NEVER USED, NOT SURVEYED						
IW-25	SOLID	49		U, Cs, Co	440 DPM	3920 DPM	42 DPM NDA
IW-25A	SOLID	22		U			
IW-25B	SOLID	12		U			
IW-26	SOLID	29		U			
IW-27	SOLID	47		NDA	NDA	NDA	
IW-28	SOLID	31		Co			
IW-29	SOLID	13		U, Cs, Ba	NDA	2240 DPM	NDA NDA
IW-30	SOLID	43		U, Cs	NDA	NDA	
IW-30A	SOLID	54		Cs	NDA	NDA	
IW-31	SOLID	7		NDA	NDA	NDA	
IW-32	SOLID	6		NDA	NDA	NDA	
IW-33	SOLID	22		NDA	NDA	NDA	
IW-34	SOLID	8		Cs	NDA	1120 DPM	NDA NDA

* SEE FIGURE 6

** THESE TWO SAMPLES BOTH LABELED IW-21. ONE IS PROBABLY IW-22.

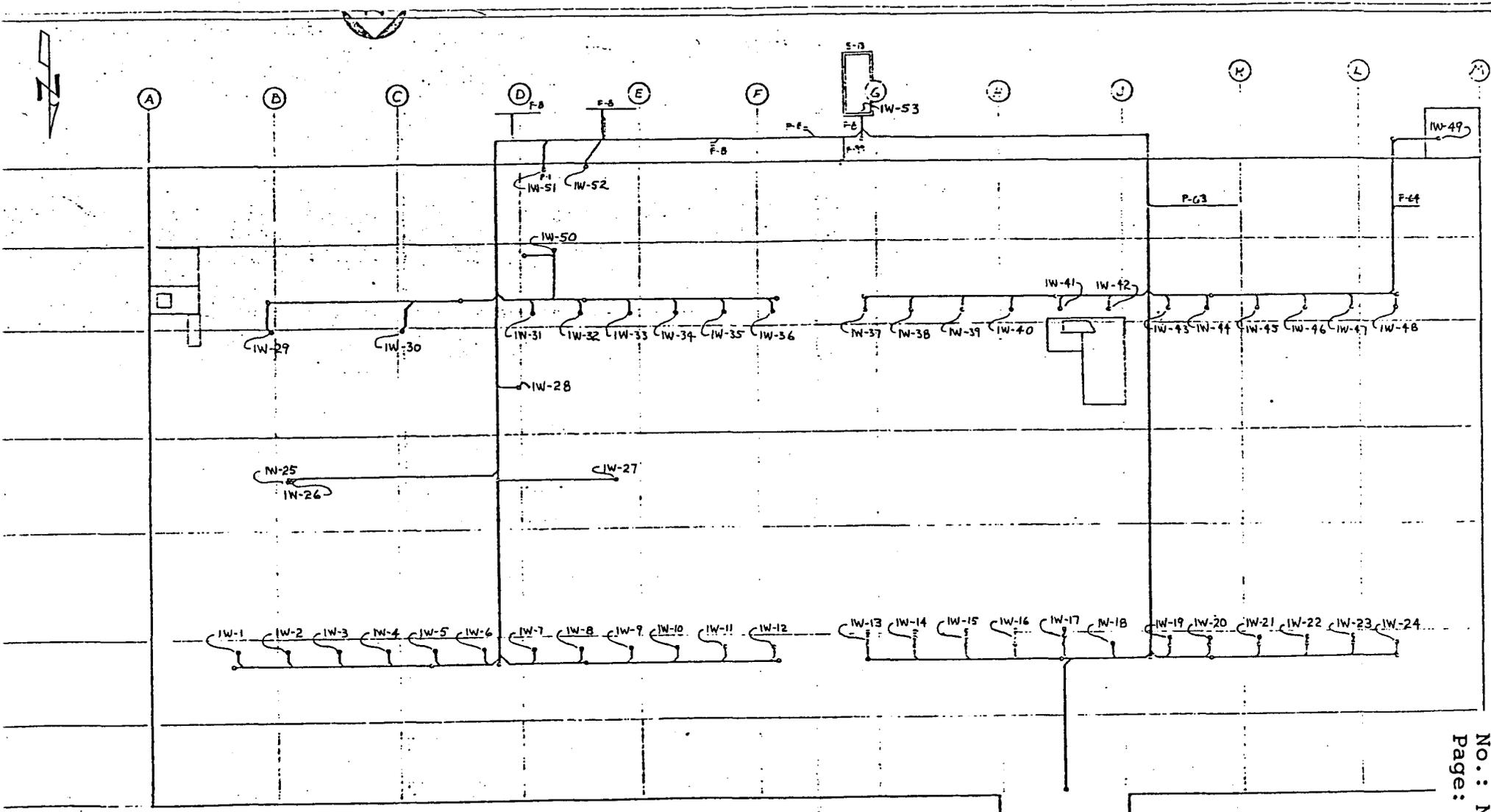
? POSSIBLE METER MALFUNCTION.

TABLE 10 CONTINUED

SURVEY SUMMARY
INDUSTRIAL WASTE DRAINS

SAMPLE * LOCATION	SAMPLE TYPE	REMOVABLE SAMPLES			DIRECT		SMEAR	
		MASS, g	VOLUME, ml	GAMMA ACTIVITY	ALPHA	BETA GAMMA	ALPHA	BETA GAMMA
IW-35	SOLID	22		U, Cs	NDA	2800 DPM	NDA	NDA
IW-36	SOLID	22		NDA	NDA	NDA		
IW-37	SOLID	36		U	NDA	NDA		
IW-38	SOLID	31		NDA	NDA	NDA		
IW-39								
IW-40	SOLID	31		NDA				
IW-41	SOLID	31		NDA				
IW-42	SOLID	6		NDA				
IW-43	SOLID	23		NDA	NDA	NDA		
IW-44	SOLID	4		NDA				
IW-45	SOLID	14		NDA	NDA	NDA		
IW-46	SOLID	9		NDA	NDA	NDA		
IW-47	SOLID	9		NDA	NDA	NDA		
IW-48	SOLID	4		NDA	NDA	NDA		
IW-48A					NDA	NDA		
IW-49	SOLID	4		NDA				
IW-50					NDA	NDA		
IW-51	DRAIN UNDER CARPETING, NOT SURVEYED							
IW-52	DRAIN UNDER CARPETING, NOT SURVEYED							
IW-53	LIQUID		40	Cs, Co, Nb, Mn				
IW-53A					NDA	NDA		
IW-53B	SOLID	9		NDA	NDA	NDA		
IW-53C	SLUDGE		450	U, Na, Cs, K, Nb, Mn, Co				
IW-53D	LIQUID		450	Co				
IW-53D-3	LIQUID		500	NDA				
IW-53D-4	SLUDGE		500	U, Cs, Nb, Mn, Co				
PIT SUMP (RM 414-30A)	POWDER	247		NDA				

* SEE FIGURE 6



UNDERFLOOR PLAN
SCALE: 1/8" = 1'-0"

GROUND FLOOR DRAIN ENTRANCE LOCATIONS
INDUSTRIAL WASTE DRAIN SYSTEM, BLDG 004 - DESOTO FACILITY

FIGURE 6.
INDUSTRIAL WASTE RETURN
DRAIN LAYOUT

Table 11 shows specific activity values derived from the gamma spectroscopy analyses. The most commonly detected radionuclide was U-235, often associated with varying amounts of U-238, as determined by the activity of its daughter, Th-234. Values enclosed in parenthesis were calculated from a single photopeak, unconfirmed by other peaks that would be expected. For several of the drains, the specific activity in the deposits is on the order of 5-20 times the allowable concentration in soil for enriched uranium (30 pCi/g), as specified by the NRC (Federal Register V46, p 52061, October 23, 1981). The presence of Am-241 in drain sample IW-25 is unexplained. There was no recorded release of plutonium or americium in the labs in DS104. The sample showed approximately 400 pCi in 49 grams of scale scraped from the drain.

An attempt was made to decontaminate those drains where radioactivity was found, per the procedure. These decontamination efforts were not completely successful and as a result, it was decided to excavate and remove all of the industrial waste drain lines within the building except for IW-1 through IW-9 (Figure 6) which are in rooms which are not being demolished. Also, the drain lines outside the building on the south side were not removed. The ends of the drain lines left in place were capped to prevent release of contamination to the ground. Results of the radiological surveys of the excavated areas will be included in the final survey report.

The sink in room 41M-35A, which connects to the sanitary drain system, was found to have a crust of hardened soap and grit on the bottom from janitors dumping mop water. A sample of this material was scraped off and measured with a gamma spectrometer. The measurements indicated about 15 nCi/g of Co-60. Survey of the sink itself showed no detectable radioactivity. Although the radioactivity level found is not significant, the drain line and trap between the sink and the floor was removed and disposed of as radioactive waste. A new line and trap were installed.

4.7 Library Books and Reports

A total of 1191 books and reports were surveyed with a total of 3181 data points. It was intended that this would be the final survey and would confirm that the books and reports were not contaminated. Figure 7 shows the two measurement setups for performing the surveys.

One-minute counts, uncorrected for background or counter efficiency, were used for the statistical analysis of the survey data. Data from the two measurement systems were analyzed separately. A distribution analysis was performed in which the activity is plotted against the cumulative probability (using a probability scale). If the measurements

TABLE 11

INDUSTRIAL WASTE DRAIN - GAMMA SPECTROSCOPIC RESULTS
Specific Activity (pCi/g or pCi/ml)

SAMPLE *	Na-22	Mn-54	Co-60	Nb-94	Ba-133	Cs-137	U-235	U-238	Am-241
IW-7							58		
IW-10							(6)		
IW-11							41		
IW-12						4	54		
IW-13							32		
IW-13A							5		
IW-14						21	40		
IW-15							7		
IW-17						54	18		
IW-25			7			169	153		
IW-25A							8		
IW-25B							7		
IW-26							2		
IW-28			6						
IW-29					21	32	27		
IW-30						17	3		
IW-30A						4			
IW-32							(8)		
IW-34						16			
IW-35						5	18		
IW-36							(2)		
IW-37							28		
IW-38							(0.4)		
IW-42							(3)		
IW-43							(1)		
IW-44							(8)		
IW-45							(2)		
IW-46							(3)		
IW-47							(3)		
IW-48							(2)		
IW-49							(6)		
IW-53		4	75	6		8	6		
IW-53B							(2)		
IW-53C	0.4	0.6	3.9	0.6		0.5	0.8		
IW-53D			0.5						
IW-53D-3							(0.01)		
IW-53D-4			8.1	3.4		0.7	0.7		

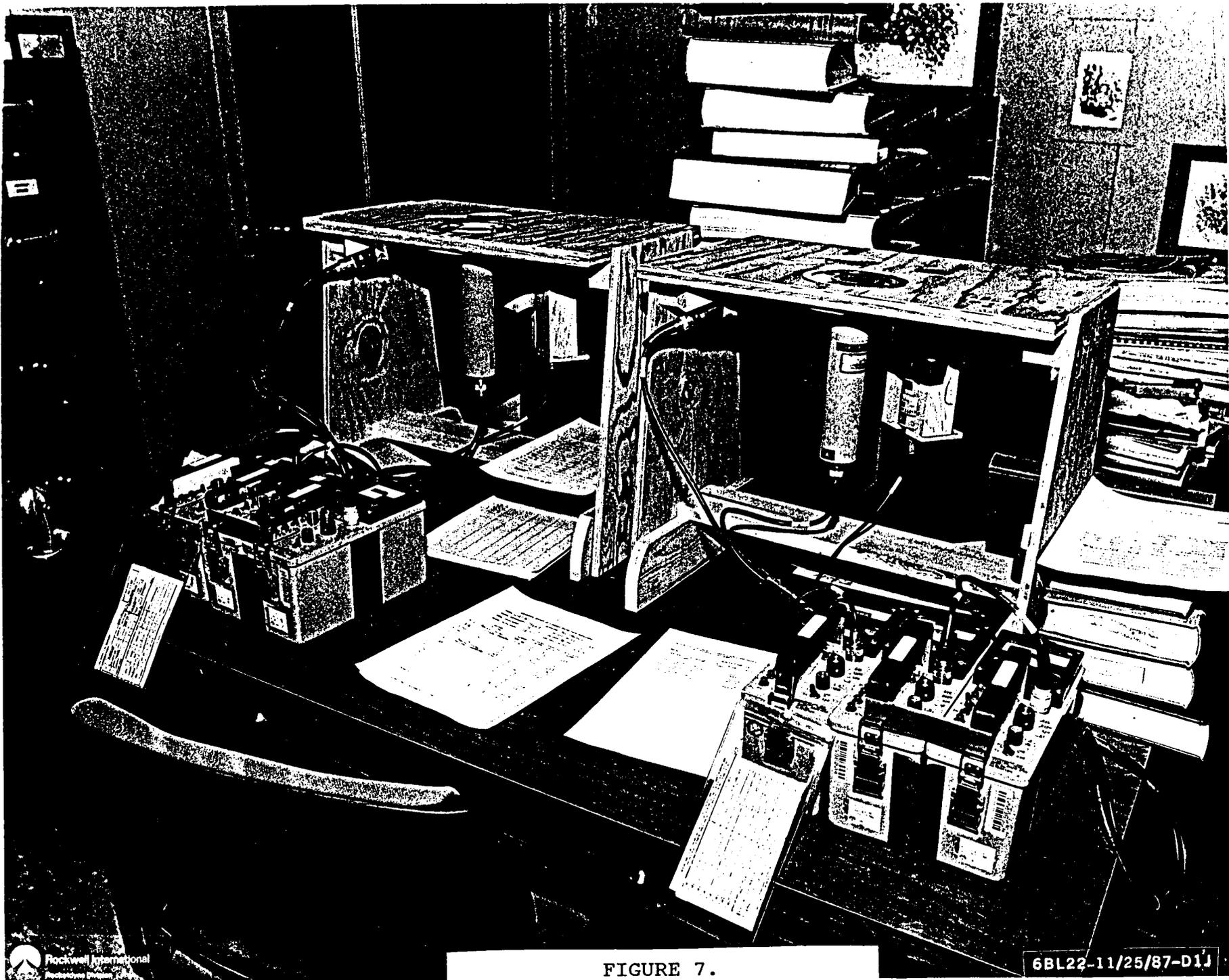


FIGURE 7.
LIBRARY BOOK MEASUREMENT SETUP

6BL22-11/25/87-D1J

have a normal distribution about an average value, then the plotted data will be a straight line. The average value in this case would be background if none of the books are contaminated with radioactive material.

Figures 8-13 show the resulting plots for the two measurement systems. Tables 11-16 are summaries of the statistical analysis results. There is no indication that any of the measurements are significantly higher than statistically expected except for one point from a gamma count using measurement system 3,7,5 (Figure 10). The book related to this data point was re-surveyed and found to have no detectable activity.

5. CONCLUSIONS

The area survey results indicate that all areas have been decontaminated to the point where there is no detectable radioactivity, within the statistical bounds of the surveys. The demolition phase may proceed with all debris disposed of as ordinary waste.

It is concluded from the results of the library book surveys that there is no significant radioactivity in any of the books and reports surveyed and that all library books and reports may be released for unrestricted use.

FIGURE 8.
ALPHA-ACTIVITY - LIBRARY BOOKS
COUNTING SYSTEM 3,7,5

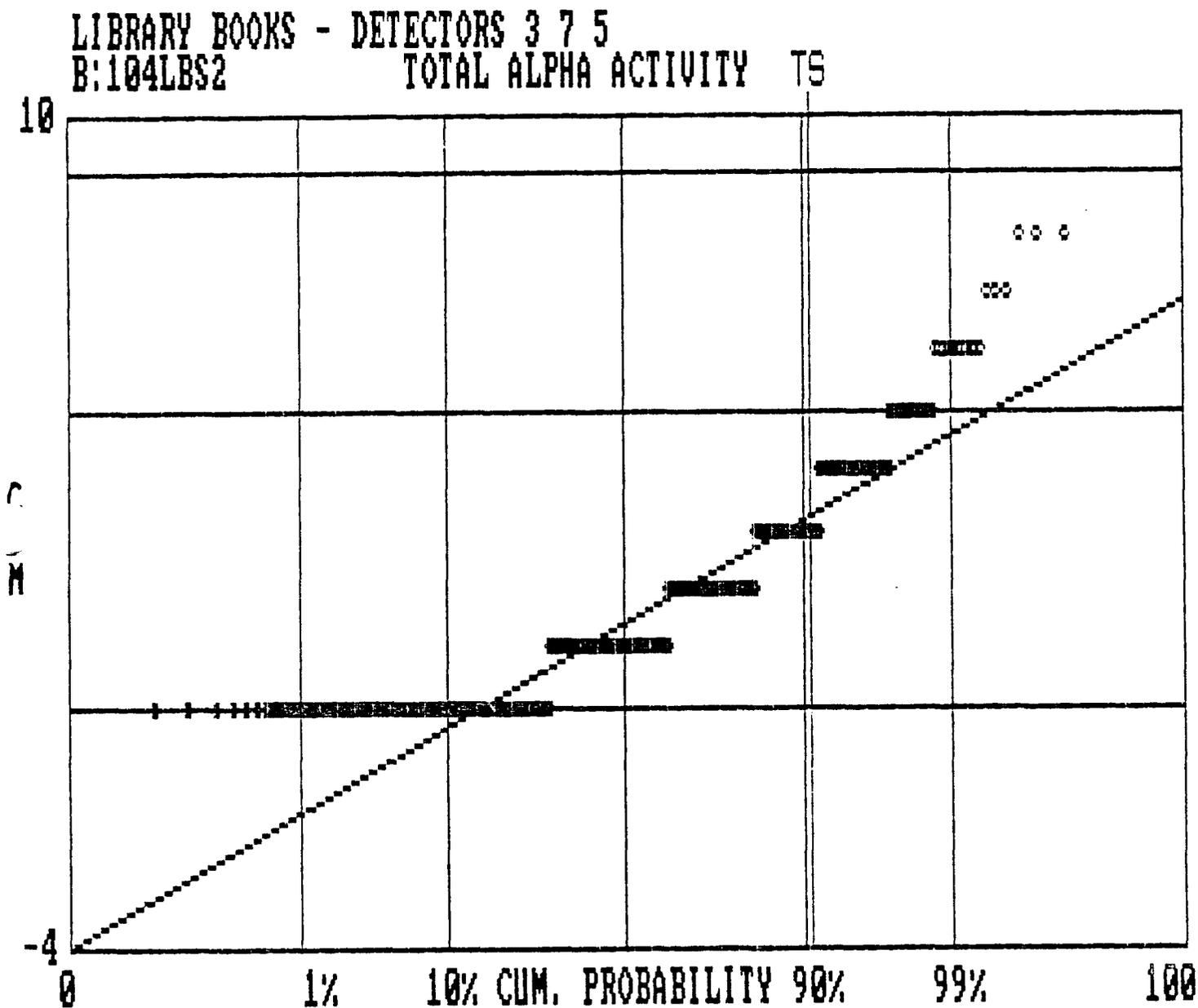


FIGURE 9.
BETA-ACTIVITY - LIBRARY BOOKS
COUNTING SYSTEM 3,7,5

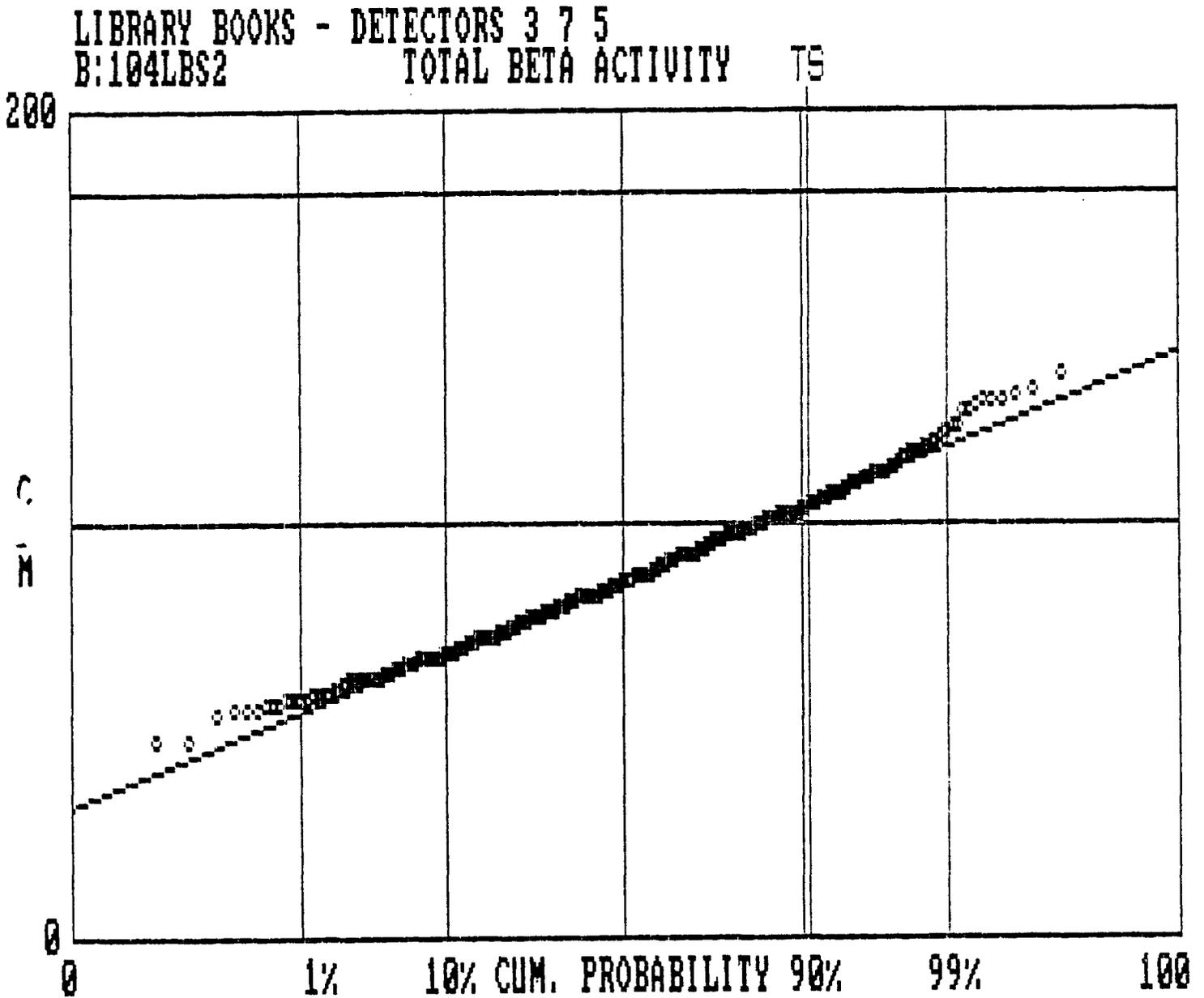
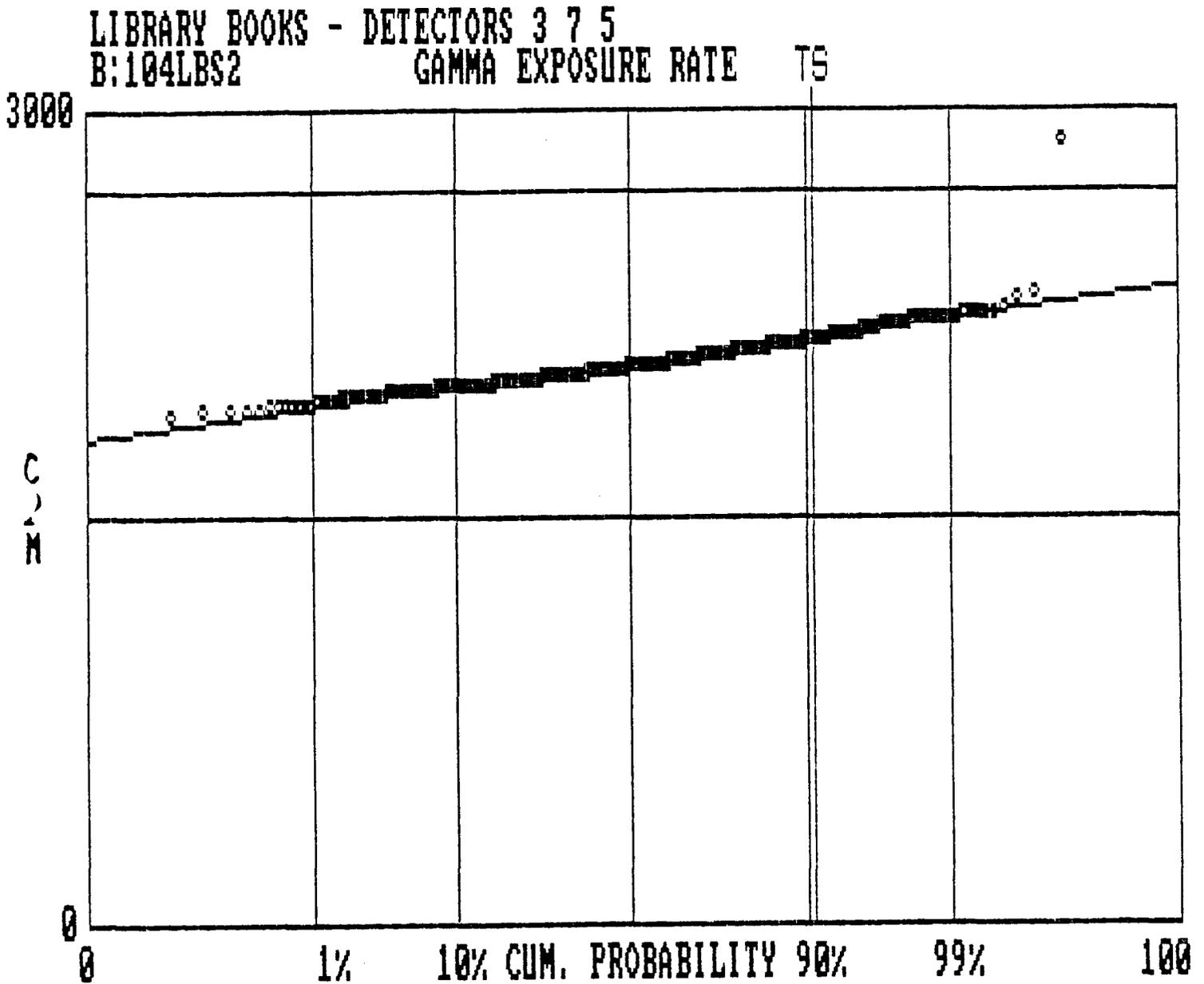


FIGURE 10.
GAMMA-ACTIVITY - LIBRARY BOOKS
COUNTING SYSTEM 3,7,5



Note: The book related to the one high data point was re-surveyed and found to have no detectable activity.

FIGURE 11.
ALPHA-ACTIVITY - LIBRARY BOOKS
COUNTING SYSTEM 4,1,6

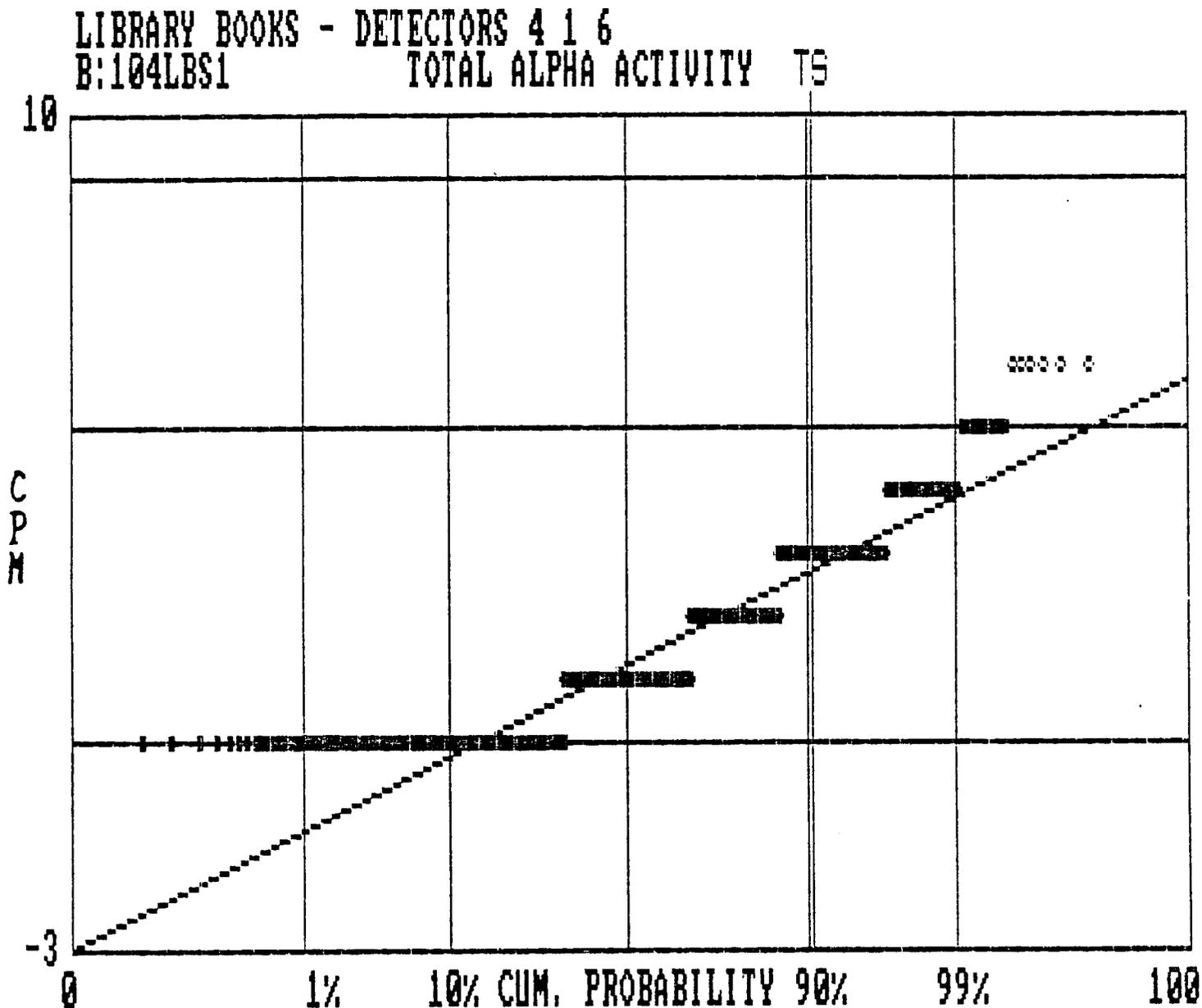


FIGURE 12.
BETA-ACTIVITY - LIBRARY BOOKS
COUNTING SYSTEM 4,1,6

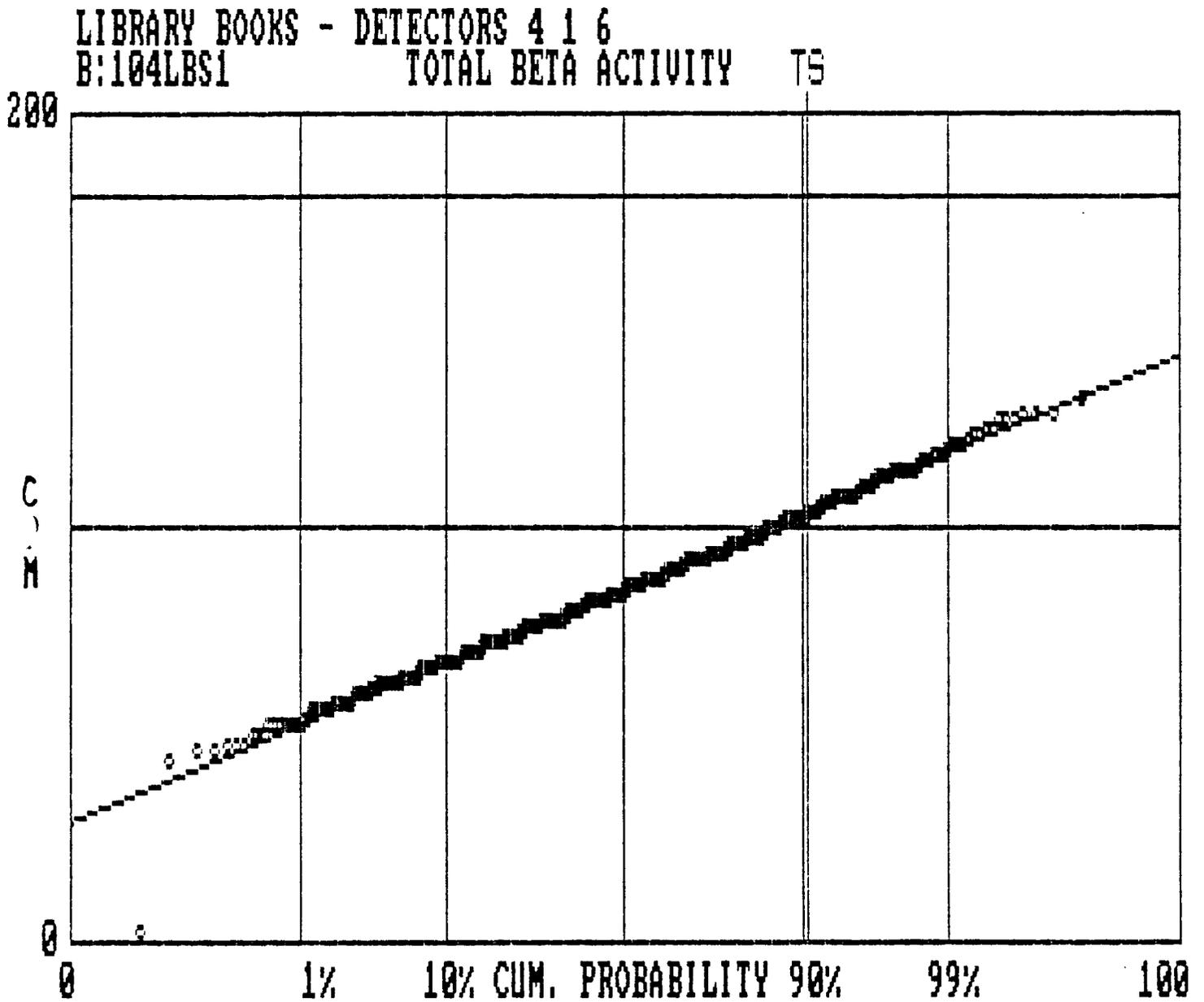


FIGURE 13.
GAMMA-ACTIVITY - LIBRARY BOOKS
COUNTING SYSTEM 4,1,6

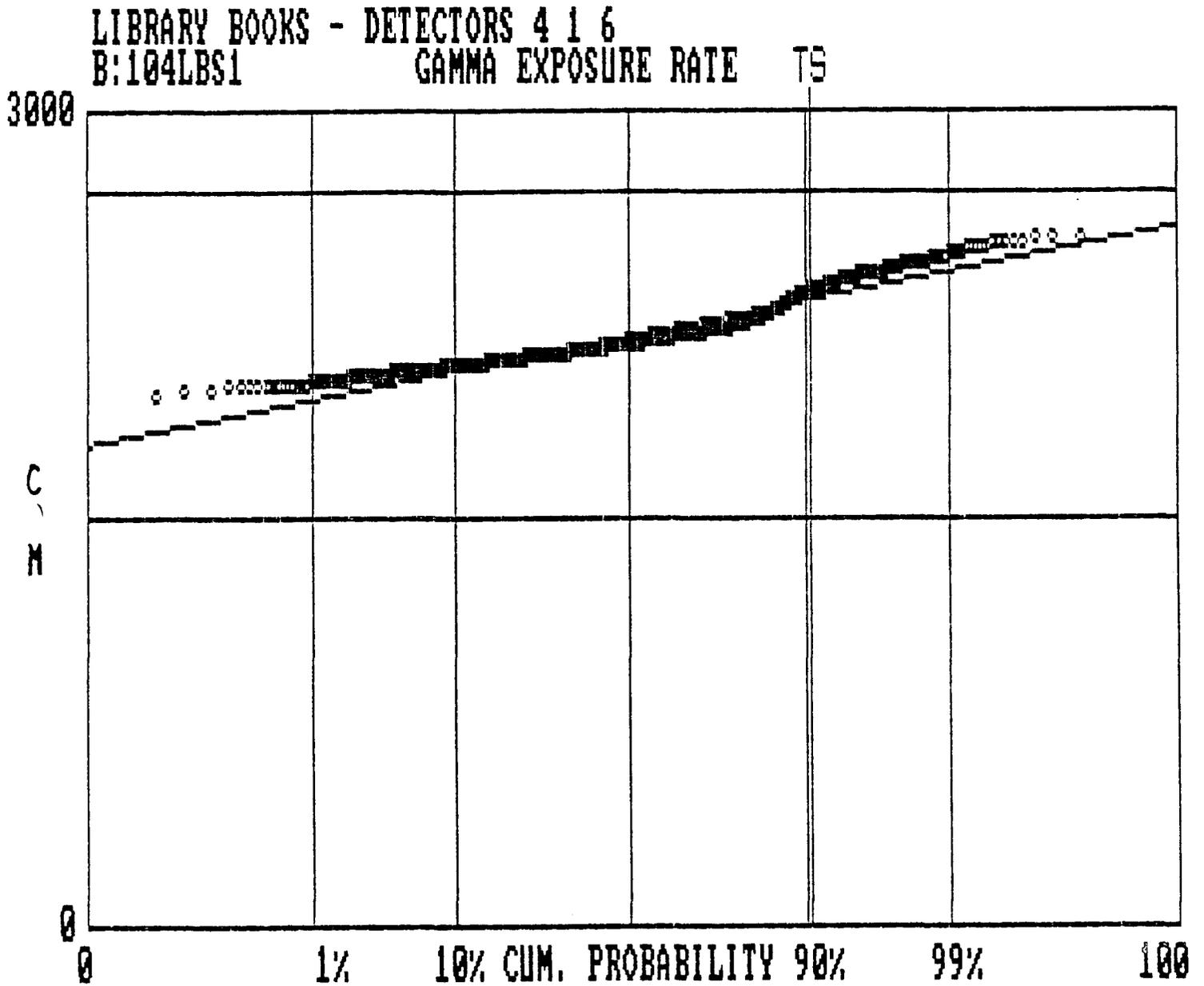


TABLE 12.
SURVEY SUMMARY - LIBRARY BOOKS
COUNTING SYSTEM 3,7,5

FILE NAME: B:104LBS2.DAT
SURVEY LOCATION: LIBRARY BOOKS - DETECTORS 3 7 5

THE SURVEY CHARACTERISTIC IS: TOTAL ALPHA ACTIVITY
NUMBER OF POINTS = 1242
AVERAGE VALUE = 1.388084
STANDARD DEVIATION = 1.365791
THE TEST STATISTIC (FOR CONSUMERS' RISK OF 0.1 AT 10% PROBABILITY) IS:
3.207258

FILE NAME: B:104LBS2.DAT
SURVEY LOCATION: LIBRARY BOOKS - DETECTORS 3 7 5

THE SURVEY CHARACTERISTIC IS: TOTAL BETA ACTIVITY
NUMBER OF POINTS = 1242
AVERAGE VALUE = 86.38245
STANDARD DEVIATION = 13.82554
THE TEST STATISTIC (FOR CONSUMERS' RISK OF 0.1 AT 10% PROBABILITY) IS:
104.7975

FILE NAME: B:104LBS2.DAT
SURVEY LOCATION: LIBRARY BOOKS - DETECTORS 3 7 5

THE SURVEY CHARACTERISTIC IS: GAMMA EXPOSURE RATE
NUMBER OF POINTS = 1242
AVERAGE VALUE = 2062.039
STANDARD DEVIATION = 70.60414
THE TEST STATISTIC (FOR CONSUMERS' RISK OF 0.1 AT 10% PROBABILITY) IS: 2156.08

TABLE 13.
SURVEY SUMMARY - LIBRARY BOOKS
COUNTING SYSTEM 4,1,6

FILE NAME: B:104LBS1.DAT
SURVEY LOCATION: LIBRARY BOOKS - DETECTORS 4 1 6

THE SURVEY CHARACTERISTIC IS: TOTAL ALPHA ACTIVITY
NUMBER OF POINTS = 1939
AVERAGE VALUE = 1.181537
STANDARD DEVIATION = 1.141238
THE TEST STATISTIC (FOR CONSUMERS' RISK OF 0.1 AT 10% PROBABILITY) IS:
2.690066

FILE NAME: B:104LBS1.DAT
SURVEY LOCATION: LIBRARY BOOKS - DETECTORS 4 1 6

THE SURVEY CHARACTERISTIC IS: TOTAL BETA ACTIVITY
NUMBER OF POINTS = 1939
AVERAGE VALUE = 85.03713
STANDARD DEVIATION = 13.93967
THE TEST STATISTIC (FOR CONSUMERS' RISK OF 0.1 AT 10% PROBABILITY) IS:
103.4631

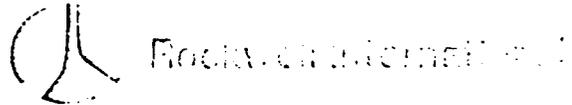
FILE NAME: B:104LBS1.DAT
SURVEY LOCATION: LIBRARY BOOKS - DETECTORS 4 1 6

THE SURVEY CHARACTERISTIC IS: GAMMA EXPOSURE RATE
NUMBER OF POINTS = 1939
AVERAGE VALUE = 2162.457
STANDARD DEVIATION = 101.6771
THE TEST STATISTIC (FOR CONSUMERS' RISK OF 0.1 AT 10% PROBABILITY) IS:
2296.857

APPENDIX

The following two pages are Internal Letters which discuss rooms in Building 104, first floor, that have been surveyed and released in the past.

Internal Letter



Date . 9/28/87

No . ray9

TO: Name, Organization, Internal Address:

. H. H. Ogtong
. 564, 055-SS11

FROM: Name, Organization, Internal Address, Title

. E. R. McGinnis
. 641, 055-T100

. 4439

Subject . Release of Room 416-63, Building 104, DeSoto

Room 416-63 in past years was the location of the L-77 reactor project. It was released for unrestricted use in 1978 by the Nuclear Regulatory Commission. After recent removal of Department 635 equipment, a backup survey was performed to verify that no radioactive contamination was spilled or tracked into the room in the period following the 1978 survey. The room was found to be well below the limits for unrestricted use.

You may assign the room to any Rocketdyne group for unrestricted use. Because of the NRC release, you may also make any modifications necessary without Radiation and Nuclear Safety involvement.

ER McGinnis

E. R. McGinnis
Health Physicist
AWC Inc.

cc: R. Tuttle T100
F. Begley T100
R. Gay T006
F. Schmidt T006
~~F. Schrag~~
R. Ahart FA44

Internal Letter



Rockwell International

Date: 10/19/87

No: ray10

TO: (Name, Organization, Internal Address)

. F. C. Schrag
 . 635, 055-T100

FROM: (Name, Organization, Internal Address, Phone)

. E. R. McGinnis
 . AWC Inc.
 . 641, 055-T100
 . 4439

Subject: Previously Released Rooms in Building 104, DeSoto

Several of the rooms on the first floor of Building 104 were either completely or partially surveyed and released in past D & D projects. Room 411-58 and 411-72 were officially released by the Nuclear Regulatory Commission in 1984. A recent backup survey performed in 411-58 showed that it is still well below the unrestricted use limits. 411-72 was resurveyed in 1986 and it also was below unrestricted use limits. Since 1986 it has been used to store laser equipment for the EMRLD project. Both of these rooms are considered released and will require no further D & D efforts during the current project.

Room 416-81 was surveyed in 1986 to criteria that exceed the standards set for the current project. However, none of the wall covering was removed for surveys inside the wall. Removal of the wall covering to the red code standard and drain line samples are all that will be required for release of this room.

The east wall of room 416-51, was previously the east wall of the control room for the L-77 reactor which was released by the NRC in 1977. No wall covering will have to be removed in that room.

E. R. McGinnis
 Health Physicist
 AWC Inc.

cc: H. H. Ogtong SS11
 R. J. Tuttle T100 *RT*
~~RINS~~ *J. A. Chapman*
 AWC Inc.
 G. S. Poucher NA02
 R. L. Gay T006