CHEM-NUCLEAR SYSTEMS, INC.

The Leader In Nuclear Waste Management Services

FINAL REPORT

CHEM-NUCLEAR SYSTEMS, INC.

PROJECT REPORT

For

FORT MCCLELLAN, ALABAMA

DECONTAMINATION PROJECT

Prepared by Hilbert Associates, Inc.

For

Chem-Nuclear Systems, Inc.

PROJECT REPORT

INTRODUCTION

Chem-Nuclear Systems, Inc. (CNSI) responded to a request for an assessment of the environmental contamination within the enclosed area in Fort McClellan, Alabama known as the Hot Cell Facility (HCF) in the fall of 1985. During the approximate period of 9/02/85 through 11/23/85, CNSI and subcontractor personnel performed an initial site investigation of the HCF and prepared an assessment report with recommendations for remedial action(s) at the facility. These remedial action recommendations were generally effected during calendar year 1986 in two site operational periods, as discussed within the text of this report.

This report integrates investigation/assessment and remedial actions at the HCF and is segmented for convenience in the following manner:

Part I of this report entails site activities over two time periods;
Phase 1 includes the radiological assessments performed during calendar year 1985 in the time period from 9/02/85 through 11/23/85;
Phase 2 provides a summary of remedial action activity performed by CNSI during the period 2/04/86 through 2/28/86.

Part II presents the summary of final remedial action at the facility during the period 8/04/86 through 9/02/86 herein called Phase 3.

CHEM-NUCLEAR SYSTEMS, INC.

PART I

(PHASE 1 AND 2)

PROJECT REPORT

For

FORT MCCLELLAN, ALABAMA

Prepared By Hilbert Associates, Inc.

For

Chem-Nuclear Systems, Inc.

1250J

PART I: PROJECT REPORT

Phase I consisted of the site radiological assessment and included the initial radiological surveys of Building #3192 and survey/sampling of the ground area within the facility during the period from approximately 9/22/85 through 11/23/85. CNSI personnel (and subcontractor personnel in 8/85) completed the HCF assessment within this period which resulted in the eventual recommendations for remedial action documented in the CNSI transmittal letter 16 December 1985.

A summary of major activities during this period is as follows:

- Development of a HCF site grid system and transferal to area blueprints. (This grid system identification was later modified to accommodate survey data during remedial activity.)

- General house cleaning and arrangement of facilities in Bldg. 3192 including assembly of radioactive waste, establishment of HEPA (portable) ventilation system and opened/inventoried existing LSA boxes of waste.

- Performed general scoping surveys in the buildings sufficient to define the potential extent and magnitude of existing contamination.

- Direct beta-gamma ground scans were performed for suspected soil contamination areas and the sanitary sewer manway.

- Extensive core sampling was conducted for soil, concrete and asphalt areas as well as other particular locations. A significant number of those samples were sent to a vendor for radionuclide characterization and remaining samples inventoried and held on site for future analysis. Vendor analysis results are shown in Enclosure 1 to this part which confirms Co-60 and Cs-137 as the dominant radionuclides. The balance of samples left on site were subsequently analyzed during Phase 3 remedial work and results of those analyses are presented in Enclosure 3 of Part II of this report.

- The location of samples and results of the ground scan survey were provided on the site blueprint drawing #B-SK-LAK-120685 provided as Attachment 1 to this report.

Phase 2 represents the initial remedial action work at HCF performed by CNSI during the period 2/04/86 through 2/26/86. In addition to removal and packaging of contaminated material, additional surveys were performed inside Building #3192 and within the hot cell itself. These surveys are transmitted as Enclosure 2 to this report.

The major remedial action work performed during this period is as follows:

- Excavation, isolation and removal to an above ground laydown location of the 1500 and 100 gallon underground holding tanks. Inlet lines and tank penetrations were sealed and the excavation left open for future sampling. Residual solids of the tanks were sampled and analyzed for waste classification as shown on Enclosure 3.

- Contaminated material in the hot cell was identified and packaged for disposal, removed and packaged for disposal the resin system.

- Excavated and packaged for disposal the source storage well outside and adjacent to Building #3180.

- Removed contaminated surface soil from area outside fence adjacent to access road. Further soil excavation was performed in this area as discussed in Part II of this report.

- The facility was then essentially secured from additional remedial action pending cost and technical resolution for further work which was effected in 8/86 and is discussed in Part II.

ENCLOSURE 1 to PART I
(7 pages)

SAMPLES FOR VENDOR ANALYSIS

SAMPLE #	IDENTIFICATION	*GRID ID
1	W-71 SS 4" Pipe Control Pit	E130
2	W-71 SS Exit Area Sample	E130
3	SP-1 3 in.	B41
4	W-67 1 ft.	E129
5	5-12 1 ft.	D17
6	W-65 3 ft.	E139
7	W-71 SS Entrance from 3180	E130
8	W-65 1 ft.	E139
9	SP-1 Exp Joint 4"	B41
10	3-11 3 ft.	C28
11	5-3 3 ft.	D3
12	5-15 1 ft.	D21
13	3-11 1 ft.	C28
14	5-5 1 ft.	D5
15	5-3 1 ft.	D3
16	Source Well 1 ft.	A8
17	5-15 3 ft.	D21
18	2-2 1 ft.	B36
19	5-1 1 ft.	D1
20	Source Well 3 ft.	A8
21	Source Well 2 ft.	A8
22	0-5 3 ft.	Access Road
23	0-5 1 ft.	Access Road
24	W-67 3 ft.	E129
25	1-49 1 ft.	A20
26	Loading Dock	C23
27	5-13, @ 1 Ft.	D19
28	5-21, @ 1 Ft.	D26
29	1-74, @ 2 Ft.	A76
30	W-71-SS, Pipe Control Pit	E130
31	W-71 SS, Pipe 3180	E130
32	W-71-SS, Pipe Exit	E130
33	SS, Street from W-71	-
34	Concrete Bldg. 3182	-
35	Concrete Bldg. 3180	-
A	Surface Soil Along Crack	A8
B	Vault Entry Portal (Concrete)	-
C	Vault Floor (Concrete)	-
D	Surface Soil	C23
E	Soil at 8" Depth	C23
F	Hot Cell Floor Drain (Concrete)	-
G	Surface Soil	Outside Fence
H	Soil at 8" Depth	Outside Fence

* see Attachment 1 of Part II for grid map locations

CHEM-NUCLEAR SYSTEMS, INC.

CUSTOMER Chem Nuclear System Inc.
ADDRESS 220 Stoneridge Drive
CITY Columbia, SC 29210
ATTENTION Roger Johnson
INVOICE NO 512177

SAMPLES RECEIVED 12/04/85 | CUSTOMER ORDER NUMBER P.O. # N438223

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	pCi/gram
# 1	Plutonium-238	0.20 ± 0.04
	Plutonium-239	0.03 ± 0.01
	Strontium-90	0.14 ± 0.11
	Uranium-233	< 0.2
	Gamma Spec:	
	Cesium-137	1.0 ± 0.2
# 2	Plutonium-238	0.22 ± 0.03
	Plutonium-239	0.02 ± 0.01
	Strontium-90	< 0.05
	Uranium-233	< 0.2
	Gamma Spec:	
	Cesium-137	1.6 ± 0.3
	Cobalt-60	177 ± 1
# 3	Strontium-90	< 0.05
	Gamma Spec:	
	Cesium-137	116 ± 1
	Cobalt-60	1.8 ± 0.1
# 4	Strontium-90	< 0.05
	Gamma Spec:	
	Cesium-137	0.5 ± 0.2
	Cobalt-60	0.8 ± 0.2
# 5	Strontium-90	< 0.05
	Gamma Spec:	
	Cesium-137	0.8 ± 0.1
	Cobalt-60	1.2 ± 0.1
# 6	Strontium-90	< 0.05
	Gamma Spec:	ND

ND - No man-made nuclides detected

APPROVED BY
12/18/85 James J. Mueller, President

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Telephone 505/982-9841

CHEM-NUCLEAR SYSTEMS, INC.

CUSTOMER Chem Nuclear System Inc.
ADDRESS 220 Stoneridge Drive
CITY Columbia, SC 29210
ATTENTION Roger Johnson
INVOICE NO 512177

SAMPLES RECEIVED 12/04/85 | CUSTOMER ORDER NUMBER P.O. # N438223

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	pCi/gram
# 7	Plutonium-238	0.35 ± 0.05
	Plutonium-239	0.14 ± 0.03
	Strontium-90	< 0.05
	Uranium-233	< 0.2
	Gamma Spec:	
	Cesium-137	1.1 ± 0.4
	Cobalt-60	191 ± 2
# 8	Strontium-90	< 0.05
	Gamma Spec:	
	Manganese-54	0.2 ± 0.1
# 9	Strontium-90	< 0.05
	Gamma Spec:	
	Cesium-137	136 ± 2
# 10	Strontium-90	< 0.05
	Gamma Spec:	ND
# 11	Strontium-90	< 0.05
	Gamma Spec:	ND
# 12	Strontium-90	< 0.05
	Gamma Spec:	
	Cesium-137	1.2 ± 0.1
	Cobalt-60	2.5 ± 0.1
# 13	Strontium-90	0.12 ± 0.06
	Gamma Spec:	ND
# 14	Strontium-90	< 0.05
	Gamma Spec:	ND
# 15	Strontium-90	1.60 ± 1.22
	Gamma Spec:	ND

ND - No man-made nuclides detected

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CHEM-NUCLEAR SYSTEMS, INC.

CUSTOMER Chem Nuclear System Inc.
ADDRESS 220 Stoneridge Drive
CITY Columbia, SC 29210
ATTENTION Roger Johnson
INVOICE NO 512177

SAMPLES RECEIVED 12/04/85 | CUSTOMER ORDER NUMBER P.O. # N438223

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	pCi/gram
# 16	Strontium-90	0.28 ± 0.13
	Gamma Spec:	
	Cobalt-60	0.9 ± 0.1
# 17	Strontium-90	< 0.05
	Gamma Spec:	ND
# 18	Strontium-90	< 0.15 ± 0.12
	Gamma Spec:	ND
# 19	Strontium-90	< 0.05
	Gamma Spec:	ND
# 20	Strontium-90	0.28 ± 0.12
	Gamma Spec:	ND
#21	Strontium-90	0.53 ± 0.18
	Gamma Spec:	
	Cesium-137	0.8 ± 0.2
#22	Strontium-90	< 0.05
	Gamma Spec:	ND
#23	Strontium-90	< 0.05
	Gamma Spec:	ND
# 24	Strontium-90	0.17 ± 0.16
	Gamma Spec:	
	Cesium-137	0.3 ± 0.1
	Cobalt-60	0.4 ± 0.1

ND - No man-made nuclides detected

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CHEM-NUCLEAR SYSTEMS, INC.

CUSTOMER Chem Nuclear System Inc.
ADDRESS 220 Stoneridge Drive
CITY Columbia, SC 29210
ATTENTION Roger Johnson
INVOICE NO 601214

SAMPLES RECEIVED 12/26/85 | CUSTOMER ORDER NUMBER P.O. # N438223

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	pCi/gram
#27 5-13 @ 1 Ft.	Gamma Spec:	
	Cesium-137	0.68 ± 0.05
	Cobalt-60	0.40 ± 0.04
#28 5-21 @ 1Ft.	Gamma Spec:	
	Cesium-137	0.93 ± 0.03
	Cobalt-60	0.25 ± 0.02
	Manganese-54	0.04 ± 0.02
#29 1-74 @ 2 Ft.	Gamma Spec:	
	Cesium-137	0.05 ± 0.01
	Cobalt-60	0.89 ± 0.01
#30 W-71-SS, Pipe Control	Gamma Spec:	
	Cesium-137	0.83 ± 0.02
	Cobalt-60	0.48 ± 0.02
#31 W-71-SS, Pipe 3180	Gamma Spec:	
	Cesium-137	0.47 ± 0.10
	Cobalt-60	212 ± 1
	Strontium-90	0.15 ± 0.11
#32 W-71-SS, Pipe Exit	Gamma Spec:	
	Cesium-137	1.09 ± 0.21
	Cobalt-60	108 ± 1
#33 SS, Street From W-71	Gamma Spec:	
	Cesium-137	0.11 ± 0.04
	Strontium-90	0.15 ± 0.12
#34 Concrete Bldg. 3182	Gamma Spec:	
	Cesium-137	238 ± 2
	Cobalt-60	15.9 ± 0.4
	Strontium-90	< 0.03
#35 Concrete Bldg. 3180	Gamma Spec:	
	Cesium-137	220 ± 2
	Strontium-90	< 0.03

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01/21/86 James J. Mueller, President

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CHEM-NUCLEAR SYSTEMS, INC.

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ATTENTION Roger Johnson
INVOICE NO 512177

SAMPLES RECEIVED 12/04/85 | CUSTOMER ORDER NUMBER P.O. # N438223

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	pCi/gram
# 25	Strontium-90	0.42 ± 0.17
	Gamma Spec:	
	Cesium-137	1.5 ± 0.1
	Cobalt-60	0.1 ± 0.1
# 26	Plutonium-238	0.17 ± 0.05
	Plutonium-239	0.15 ± 0.03
	Strontium-90	0.33 ± 0.11
	Uranium-233	< 0.2
	Gamma Spec:	
	Cesium-137	162 ± 1
	Cobalt-60	32.8 ± 0.4

ND - No man-made nuclides detected

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CHEM-NUCLEAR SYSTEMS, INC.

CUSTOMER Chem Nuclear System, Inc.
ADDRESS 220 Stoneridge Drive
CITY Columbia, SC 29210
ATTENTION Roger Johnson
INVOICE NO 511067

SAMPLES RECEIVED 10/29/85 | CUSTOMER ORDER NUMBER N438223

TYPE OF ANALYSIS Soil & Concrete

Sample Identification	Type of Analysis	pCi/gram
Alpha Field	Plutonium-238	0.24 ± 0.05
	Plutonium 239/240	< 0.05
	Uranium-234	0.11 ± 0.01
	Uranium-235	< 0.05
	Uranium-238	0.15 ± 0.02
A. Surface soil along crack	Strontium-90	0.37 ± 0.07
	Gamma Spectralanalysis:	
	Cesium-134	0.22 ± 0.05
	Cesium-137	4.07 ± 0.10
	Cobalt-60	19.4 ± 0.3
	Uranium-235	0.17 ± 0.10
B. Lab vault ent. portal con.	Strontium-90	1.31 ± 0.24
	Gamma Spectralanalysis:	
	Cesium-134	2.62 ± 0.30
	Cesium-137	2580 ± 10
	Cobalt-60	60.9 ± 1.9
	Uranium-235	4.51 ± 1.34
C. Floor in lab. vault con.	Strontium-90	0.03
	Gamma Spectralanalysis:	
	Cesium-134	3.43 ± 0.40
	Cesium-137	6600 ± 11
	Cobalt-60	44.5 ± 0.9
	Uranium-235	5.52 ± 1.68
D. Soil surface	Strontium-90	0.09 ± 0.06
	Gamma Spectralanalysis:	
	Cesium-134	0.43 ± 0.10
	Cesium-137	72.3 ± 0.8
	Cobalt-60	15.9 ± 0.3
	Uranium-235	ND

ND - None Detected

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CHEM-NUCLEAR SYSTEMS, INC.

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ADDRESS 220 Stoneridge Drive
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ATTENTION Roger Johnson
INVOICE NO 511067

SAMPLES RECEIVED 10/29/85 | CUSTOMER ORDER NUMBER N438223

TYPE OF ANALYSIS Soil & Concrete

	Sample Identification	Type of Analysis	pCi/gram
E.	Soil at #5/8" deep	Strontium-90	< 0.03
		Gamma Spectralanalysis:	
		Cesium-134	0.33 ± 0.08
		Cesium-137	364 ± 7
		Cobalt-60	71.4 ± 0.3
		Uranium-235	0.54 ± 0.14
F.	Fl. drain con. Hot Cell	Strontium-90	< 0.03
		Gamma Spectralanalysis:	
		Cesium-134	3.20 ± 0.30
		Cesium-137	16.3 ± 0.1
		Cobalt-60	213 ± 2
		Uranium-235	ND
G.	Surf. soil in roped area	Strontium-90	< 0.03
		Gamma Spectralanalysis:	
		Cesium-134	0.16 ± 0.05
		Cesium-137	16.3 ± 0.1
		Cobalt-60	30.7 ± 0.2
		Uranium-235	0.10 ± 0.05
		Mercury 203	0.09 ± 0.04
H.	Soil at #8/8" deep	Gamma Spectralanalysis:	
		Cesium-134	0.06 ± 0.03
		Cesium-137	9.10 ± 0.10
		Cobalt-60	13.2 ± 0.1
		Uranium-235	0.08 ± 0.03
		Mercury 203	0.05 ± 0.02

ND - None Detected

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11 13-85

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PHASE 2 SURVEY RESULTS

ENCLOSURE 2 to PART I
(23 pages)

1250J

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 8/5/86 | TIME START: 1345 | TIME COMP: 1746 | PAGE 1 OF 1

ACTIVITY/LOCATION: A. McClellan Hot Cell

SURVEYOR: R.W. Johnson | PHONE: 256-6450

DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

☒ NO ACTION REQ'D ☐ CIRCLED READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

COMMENTS: INITIAL ENTRY INTO HOT CELL (MAD #1) PRM-7 USED for SURVEY AFTER RAD LEVEL DETERMINED TO BE < 1 mR/hr ① Cal date 7/25/86 PRM-7 #452

PERMISSIBLE LEVELS
- ☐ < 220 dpm/100 cm² ALPHA
- ☐ < 2,200 dpm/100 cm² BETA GAMMA
- ☐ RESURVEY

CSCA AREA CONTROL LEVELS
- ☐ 220 dpm/100 cm ALPHA
- ☐ 2200 dpm/100 cm BETA-GAMMA

☒ OTHER (SEE COMMENTS)

	CONTAMINATION SURVEY	INSTRUMENT	ALPHA	BETA GAMMA
		625 (Alpha)		MS-2/NP-210T
	RADIATION SURVEY	INSTRUMENT	NEUTRON	BETA GAMMA
		5819 (Gamma)		ESP/NP-170

INDEPENDENT RADCON REVIEW: [illegible] DATE: [illegible]

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA GAMMA
SOURCE ID		Co60 #3309	①
SOURCE STRENGTH	dpm	8145 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1013 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☒ UNSAT ☐

BETA-GAMMA BACKGROUND (400 cpm) 338 dpm 0.03 mR/hr

REASON FOR SURVEY: ☐ PROCEDURE - NO ☒ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co⁶⁰ dpm PROBE	BETA-GAMMA EQUIV Co⁶⁰ dpm/100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
1			402		48	Floor I-8
2			1785		130	Floor Drain G-3
3			1564			Top of door A-11
4			1447			Grave Rail K-6
5			20595			Transformer L-1
6			1143			Mirror N-5
7					60	Door well I-10
8					120	Door well G-10
9					70	Door well F-10
10					48	Floor G-8
11					100	Floor F-6
12					100	Floor G-6
13					100	Floor I-6
14					180	Floor I-4
15					280	Floor I-1
16					100	Floor H-1
17					120	Floor E-1
18					140	Floor E-3
19					80	Floor C-1
20					80	Floor A-1
21					180	Floor A-3
22					210	Floor A-5
23					160	Floor C-3
24					170	Floor C-5
25					0.02 mR/hr	General Area
26						
27						
28						
29						
30						
31						
32						
33						
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* THE KNOWING & WILLFUL RECORDING OF FALSE, FICTICIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/6/86 | TIME START: 1515 | TIME COMPL: 1830 | PAGE 1 OF 1

ACTIVITY/LOCATION: H. McGlohn - Hot Cell | SURVEYOR: A. Manning / D. Conette | PHONE: (205) 256-0450

DAILY / WEEKLY / MONTHLY — CONTAMINATION AND — DAILY / WEEKLY / MONTHLY — RADIATION SURVEY

COMMENTS: Hot Cell Study Survey (Map # 1 - Floor)

M.D.A. = 294 dpm/100cm² ; 1min CBCK = 43cpm

① Cal. date 3rd (UK) 4 May 86

☒ NO ACTION REQ'D ☐ CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS: ☐ < 220 dpm/100 cm² ALPHA; ☐ < 2200 dpm/100 cm² BETA-GAMMA; ☐ RESURVEY

CSCA AREA CONTROL LEVELS: ☐ 220 dpm/100 cm² ALPHA; ☐ 2200 dpm/100 cm² BETA-GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS		RADIATION
	ALPHA	BETA-GAMMA Co60	BETA/GAMMA
SOURCE I.D.		SaS 53009	①
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1143 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☒ UNSAT ☐

BETA-GAMMA BACKGROUND 326.2 dpm 46 cpm 0.015 mR/hr

CONTAMINATION SURVEY	INSTRUMENT	ALPHA	BETA-GAMMA
	AMF 623		HS-2 w/HP-210T
RADIATION SURVEY	INSTRUMENT	NEUTRON	BETA-GAMMA
	Kaiser 8-592		KM-7

INDEPENDENT RADCON REVIEW [illegible] DATE [illegible]

REASON FOR SURVEY: ☐ PROCEDURE – NO ____ ☒ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co60 dpm/PROBE	BETA-GAMMA EQUIV Co60 dpm/100 cm²	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
1			197.6	200		E-9 Floor, door-Well
2			20.61	70		G-11 " " "
3			1220	40		I-9 " " "
4			1213	80		I-7 Floor
5			1178	110		F-5 "
6			11536	2000		D-4 Base, Wall rack
7			11472	120		B-3 " " "
8			1304	70		C-1 " " "
9			1149	130		F-2 Floor
10			1178	140		I-2 "
11			1931	130		G-3 Floor, drain area
12			2013	120		K-5 Floor, [illegible] table
13			1782	220		L-3 " " "
14			1279	290		M-1 " " "
15			2268	250		N-3 " " "
16						
17						
18			728	300		Wall Ledge B-6
19			1976	600		" " A-5
20			1352	400		" " C-1
21			4213	2200		" " G-6
22			804	1200		" " D-4
23			10747	240		" " M-6
24			12729	340		" " L-1
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CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/12/86 | TIME START: 0915 | TIME COMPL: 1430 | PAGE 1 OF 1

ACTIVITY/LOCATION: Ft McClellan Hot Cell | SURVEYOR: [illegible] / D. Crenette | PHONE: (205) 236-0450

☑ NO ACTION REQ'D ☐ CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2200 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CRCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2200 dpm/100 cm² BETA-GAMMA

☑ OTHER (SEE COMMENTS)

☐ DAILY ☐ WEEKLY ☐ MONTHLY CONTAMINATION AND ☐ DAILY ☐ WEEKLY ☐ MONTHLY RADIATION SURVEY

COMMENTS: Hot Cell Study Survey (Cell sweep walls, Cell floor - inside, deck after scrubbing central pt.)
MDA = 217 dpm/100 cm²
① Cal. Date - 4 May 86 ND - NOT DETECTABLE

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE ID		53507 Co60	①
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1153 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☑ UNSAT ☐	SAT ☑ UNSAT ☐

	INSTRUMENT		
CONTAMINATION SURVEY	(4[illegible]) [illegible]23	ALPHA	BETA/GAMMA NIS-2 w/ 11.1-210T
RADIATION SURVEY	(205) [illegible]22	NEUTRON	BETA/GAMMA PRM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 2/[illegible]/86

BETA-GAMMA BACKGROUND (44 cpm) 323 dpm 0.015 mR/hr

REASON FOR SURVEY ☐ PROCEDURE – NO ☑ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co60 dpm/PROBE	BETA-GAMMA EQUIV Co60 dpm/100 cm²	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☑	ITEM OR LOCATION
1			1218			D-1 well
2			137			D-1 Plug
3			66			C-3 Plug
4			73			C-3 well
5			81			B-2 well
6			125			B-2 Plug
7			110			B-2 basket
8			1646			A-4 well
9			ND			A-4 Plug
10			164			East Grip
11			1433			East upper Shaft
12			1940			East Lower Shaft
13			1154			West Grip
14			1132			West upper Shaft
15			165			West Lower Shaft
16						
17						
18			1056			Inside wheel - of PM cell
19			—			Top right
20			157			door - middle left
21			155			wheel
22						
23			AREA Survey	AFTER		Hot Cell Door Closed
24			44	13		Floor by East Wall
25			169	22		Middle of Trough - back
26			117	20		left Track - L lower up
27			103	35		Trough [illegible]
28			ND	40		Right Track by wheel
29						
30			AREA Sweep	after control point Removed		
31			ND	15		Classroom - Back Floor
32			ND	10		Classroom - Floor by side door
33			73.4	10		Floor under Manipulator [illegible]
34			15	10		Hallway Floor [illegible]
35			ND	10		[illegible]
36			59	15		Floor via Front of shower
37			ND	18		Floor [illegible]
38			ND	10		Floor - by front doors
39			51	16		Floor - [illegible]
40			79	12		Floor - in Front of Stairs

Lobby

* THE KNOWING & WILLFUL RECORDING OF FALSE, FICTICIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

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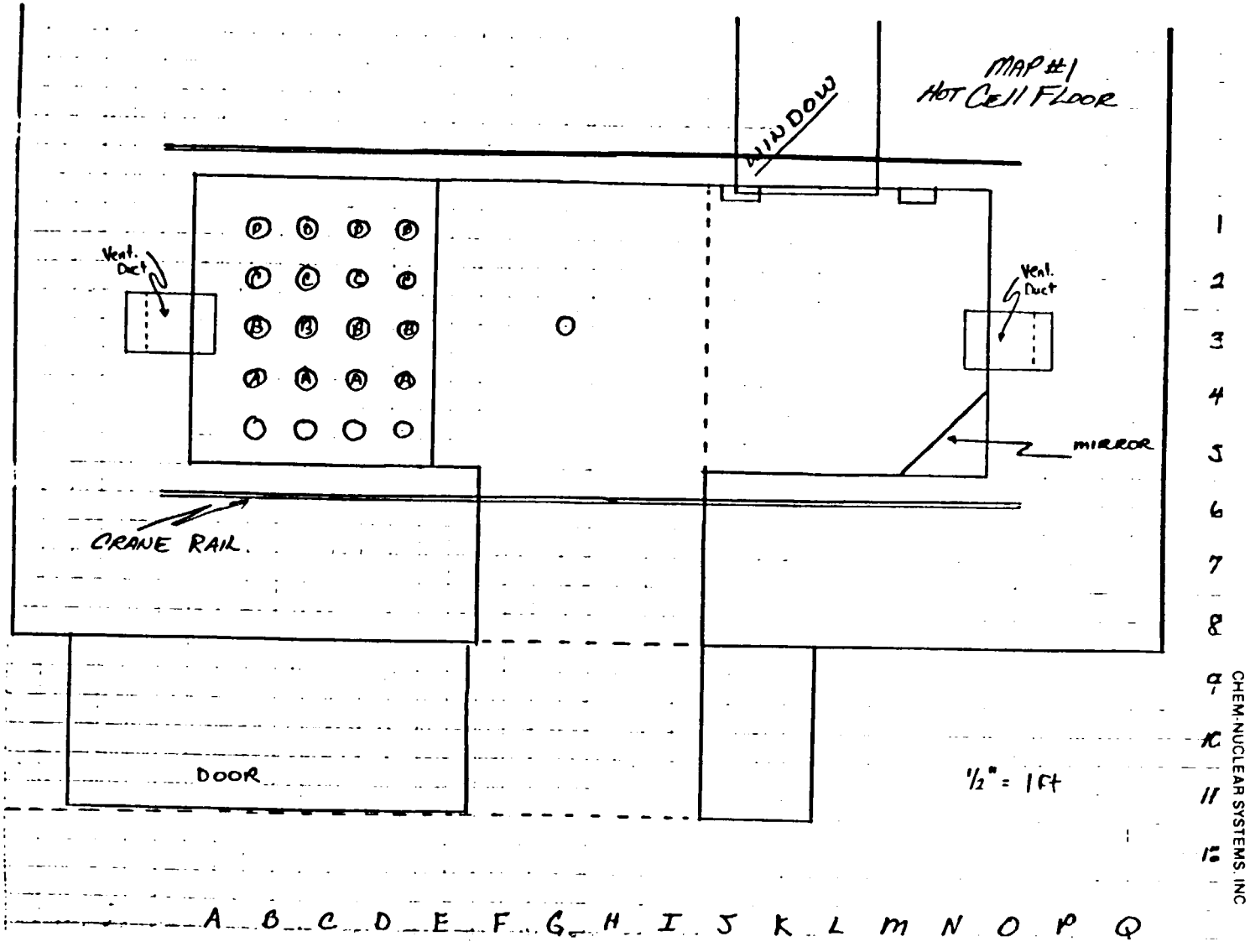

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/6/86 | TIME START: 1203 | TIME FINISH: 1350 | PAGE 1 OF 1

ACTIVITY/LOCATION: Ft. McClellan Hot Cell | SURVEYOR: R.W. Johnson | PHONE: 805 236-0150

☒ NO ACTION REQ'D ☐ CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2200 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2200 dpm/100 cm² BETA-GAMMA

☒ OTHER (SEE COMMENTS)

☐ DAILY ☐ WEEKLY ☐ MONTHLY CONTAMINATION AND ☒ DAILY ☐ WEEKLY ☐ MONTHLY RADIATION SURVEY

COMMENTS: Hot Cell Study Survey (MAP #2)
MDA = 827 dpm/100cm²
ND = Not Detectable
Cal. Date 4 May 86

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE I.D.		#3509 Co60	①
SOURCE STRENGTH	dpm	8145 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1145 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☒ UNSAT ☐

	INSTRUMENT	ALPHA	BETA-GAMMA
CONTAMINATION SURVEY	623 (LSA)		MS-2 w/HP-210
RADIATION SURVEY	422 (LSA)	NEUTRON	PRM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 2/7/86

BETA-GAMMA BACKGROUND (Hcpm) 327 dpm .015 mR/hr

REASON FOR SURVEY ☐ PROCEDURE – NO ☒ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co60 dpm/PROBE	BETA-GAMMA EQUIV Co60 dpm/100 cm²	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
1			256	8		MTR, Drive B-1
2			1863	13		Transmission B-1
3			43	10		Door C-3
4			28	13		Wheel D-1
5			149	14		Wheel H-1
6			4330	30		Door-Top C-8
7			8760	40		Door-Top E-8
8			7	8		Door F-5
9			4408	20		Box, Pipe, Top B-10
10			ND	22		Box, Pipe, Face B-9
11			78	8		Wall A-4
12			ND	20		Wall C-10
13			ND	22		Wall B-11
14			ND	18		Conduit B-9
15			590	20		Surface, Upward G-8
16			64	32		Surface, Upward F-13
17			ND	32		Surface, Upward F-13

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co60 dpm/PROBE	BETA-GAMMA EQUIV Co60 dpm/100 cm²	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
18			36	14		Surface, Upward M-9
19			21	32		Surface, Upward M-13
20			28	24		Conduit N-12
21			ND	12		Pipe Q-10
22			ND	12		Pipe R-9
23			171	12		Tube P-12
24			ND	8		Valve P-7
25			ND	9		Box, Pipe, Top O-5
26			ND	11		Wall N-7
27			ND	9		Wall N-2
28			ND	10		Switch N-5
29			384	17		Hose Rack P-5
30			ND	12		Wall P-9
31			ND	9		Wall Q-3
32						
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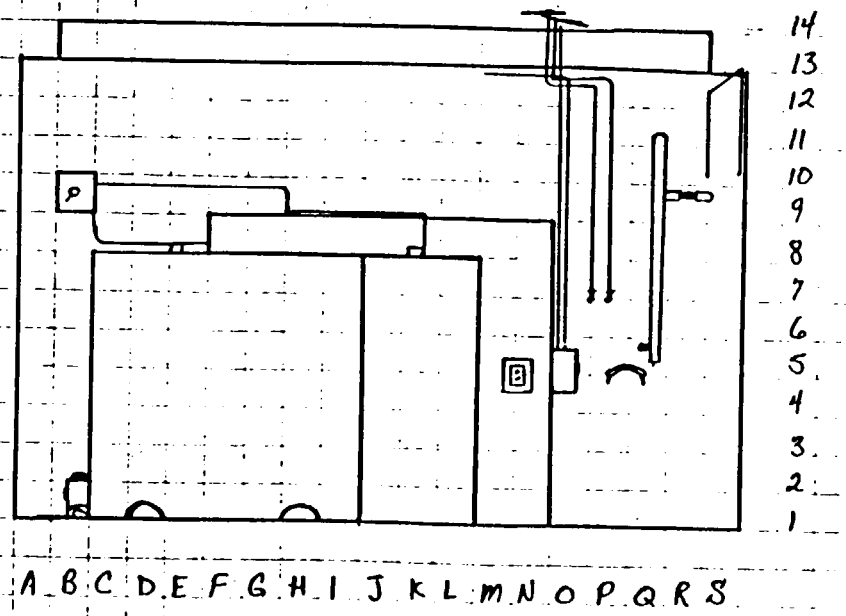
MAP #2
North Hot Cell Wall
Exterior



1/4" = 1ft

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/6/86 | TIME START: 1545 | TIME COMPL: 1740 | PAGE 1 OF 1

ACTIVITY/LOCATION: Ft. McClellan - Hot Cell | SURVEYOR: M Manning / D. Crisafe | PHONE: (205) 236-0400

DAILY / WEEKLY / MONTHLY: CONTAMINATION AND RADIATION SURVEY

☒ NO ACTION REQ'D ☐ CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2200 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2200 dpm/100 cm² BETA-GAMMA

☒ OTHER (SEE COMMENTS)

COMMENTS: Hot Cell Study Survey (Map #3 West, East INSIDE Walls)
MDA 200 dpm/100cm² ND = NOT DETECTABLE
① Cal. due date - 4 May 86

CONTAMINATION SURVEY	INSTRUMENT DESCRIPTION: 623 (RM)	ALPHA / BETA-GAMMA: MS-2 w/MP-210T
RADIATION SURVEY	INSTRUMENT: 177 (CRM)	NEUTRON / BETA GAMMA: PRM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 2/6/86

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE I D		S 33069 (Co 60)	①
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1145	mR/hr
	SAT ☐ UNSAT ☐	SAT ☑ UNSAT ☐	SAT ☑ UNSAT ☐

BETA-GAMMA BACKGROUND (96 cpm) 327 dpm 0.015 mR/hr

REASON FOR SURVEY: ☐ PROCEDURE – NO ☒ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th dpm/PROBE	ALPHA EQUIV Th dpm/100 cm²	BETA-GAMMA EQUIV Co 60 dpm/PROBE	BETA-GAMMA EQUIV Co 60 dpm/100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☑	ITEM OR LOCATION (East Wall)
1			ND KMDA	100		S-3 Wall
2			ND KMDA	120		Q-11 duct
3			142.7	60		M-8 Wall
4			144.1	120		O-15 duct
5			135.6	100		Q-13 duct (side)
6			149.8	100		L-17 Wall
7			ND KMDA	110		S-16 "
8			135.6	120		P-17 duct
9			1128	100		N-4 Wall
10			128.4	80		R-6 "
11						
12						
13						
14						
15						
16						
17						

SWIPE/PROBE NO	ALPHA EQUIV Th dpm/PROBE	ALPHA EQUIV Th dpm/100 cm²	BETA-GAMMA EQUIV Co 60 dpm/PROBE	BETA-GAMMA EQUIV Co 60 dpm/100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☑	ITEM OR LOCATION (West Wall)
18						
19						
20						
21			1165	220		I-20 Wall
22			1278	240		I-13 Steam piping
23			ND KMDA	800		E-21 duct
24			123	190		B-19 Wall
25			ND KMDA	10000		F-11 duct
26			2463	460		C-10 Steam Hose rack
27			173	180		G-7 Wall
28			ND KMDA	210		A-7 "
29			38	120		H-4 "
30			38	140		C-3 "
31						
32						
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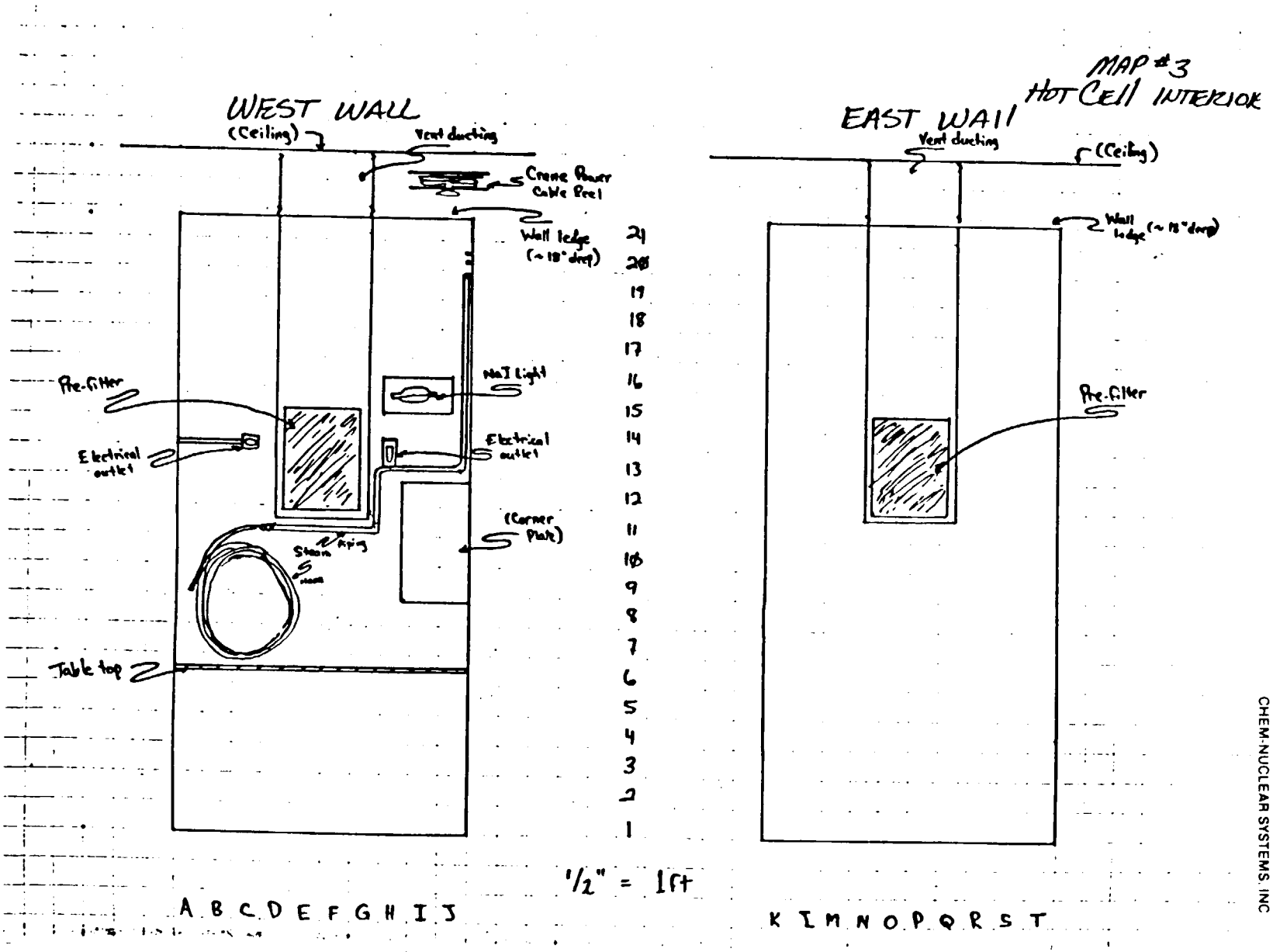
CHEM-NUCLEAR SYSTEMS, INC



CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/6/86 | TIME START: 1615 | TIME COMPL: 1845 | PAGE 1 OF 1

ACTIVITY/LOCATION: Ft McClellan - Hot Cell | SURVEYOR: M Manning / D. Conette | PHONE: (803) 236-0598

DAILY / WEEKLY / MONTHLY ☐ CONTAMINATION AND ☐ DAILY / WEEKLY / MONTHLY ☐ RADIATION SURVEY

☒ NO ACTION REQ'D ☐ CIRCLED READINGS -- DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

COMMENTS: Hot Cell Study Survey (Map 4 - North Wall)

MDA = 204 dpm/100 cm² ND = NOT DETECTABLE

① Cal. due date - 4 May 86

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2700 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 270 dpm/100 cm² ALPHA
☐ 2700 dpm/100 cm² BETA-GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS		RADIATION
	ALPHA	BETA/GAMMA	BETA/GAMMA
SOURCE I.D.		B 3309 (Co 60)	①
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1145 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☒ UNSAT ☐

CONTAMINATION SURVEY	INSTRUMENT	ALPHA	BETA-GAMMA
RADIATION SURVEY	623 (Ludlum) / 427 (ENSI)	NEUTRON	MS-2 w/HP-210T / PRM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 2/12/86

BETA-GAMMA BACKGROUND (46 cpm) 327 dpm 0.015 mR/hr

REASON FOR SURVEY ☐ PROCEDURE -NO ☒ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th* dpm/PROBE	ALPHA EQUIV Th* dpm/100 cm²	BETA-GAMMA EQUIV Co* dpm/PROBE	BETA-GAMMA EQUIV Co* dpm/100 cm²	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
1			135.6	120		D-9
2			ND KAPPA	260		E-20
3			135.6	210		C-18
4			114.2	180		F-11
5			114.2	200		B-10
6			ND KAPPA	140		E-7
7			164.0	120		K-14
8			1135	140		L-17
9			1170.6	320		H-16 Hose on Reel
10			121.3	100		S-13
11			ND KAPPA	100		W-12
12			ND KAPPA	120		Z-4
13			114.2	100		T-5
14			114	100		AA-17
15			ND KAPPA	100		X-7
16						
17						
18						
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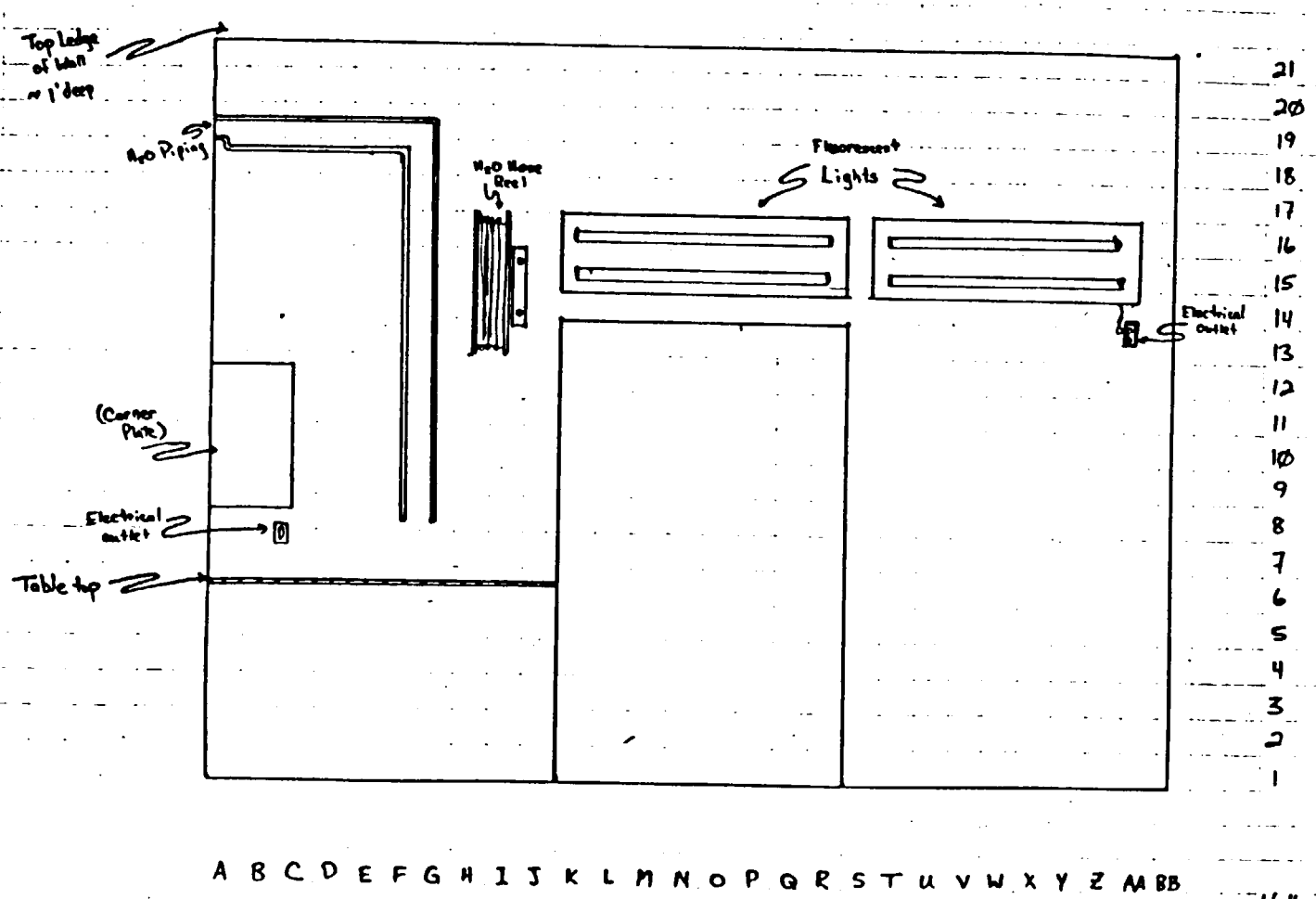
MAP #4
HOT CELL INTERIOR
North Wall



1/2" = 1ft

CHEM-NUCLEAR SYSTEMS, INC.

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/6/86 | TIME START: 1645 | TIME COMPL: 1900 | PAGE 1 OF 1

ACTIVITY/LOCATION: Ft McCoy Main-Hot Cell | SURVEYOR: M Manning, D. Gauthe | PHONE: (803) 256-0450

DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND RADIATION SURVEY

☒ NO ACTION REQ'D ☐ CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

COMMENTS: Hot Cell Study Survey (Map #5 - South Wall)
MDA = 224 dpm/100cm² ND = Not Detectable
D Cal due date - 4 May 86

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2200 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2200 dpm/100 cm² BETA-GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE I.D.		55Mn (Co60)	1
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1145 dpm	mR/hr
	BAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☒ UNSAT ☐

CONTAMINATION SURVEY	INSTRUMENT NO 6230 (Ludlum) ALPHA / BETA-GAMMA
RADIATION SURVEY	INSTRUMENT NO 42 (Ludlum) NEUTRON / BETA-GAMMA MSC2 w/HP-210T PRM-7

INDEPENDENT RADIOLOGICAL REVIEW: [illegible] DATE: 2/6/86

BETA-GAMMA BACKGROUND (46cpm) 327 dpm 0.0015 mR/hr

REASON FOR SURVEY ☐ PROCEDURE – NO ____ ☒ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co⁶⁰ dpm PROBE	BETA-GAMMA EQUIV Co⁶⁰ dpm 100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
1			ND	120		V-4 Wall
2			ND	140		T-3 "
3			ND	140		Z-18 "
4			ND	140		W-19 Main. Base
5			142.7	140		S-17 Wall
6			ND	200		Z-10 "
7			512	60		V-7 "
8			194.2	120		R-13 "
9			142.7	100		M-14 "
10			142.7	120		C-16 "
11			ND	100		D-4 "
12			ND	100		I-1 "
13			ND	100		O-4 "
14			ND	120		P-13 Elec. Box
15			ND	100		J-10 Wall (Chipped area)
16						
17						
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20						
21						
22						
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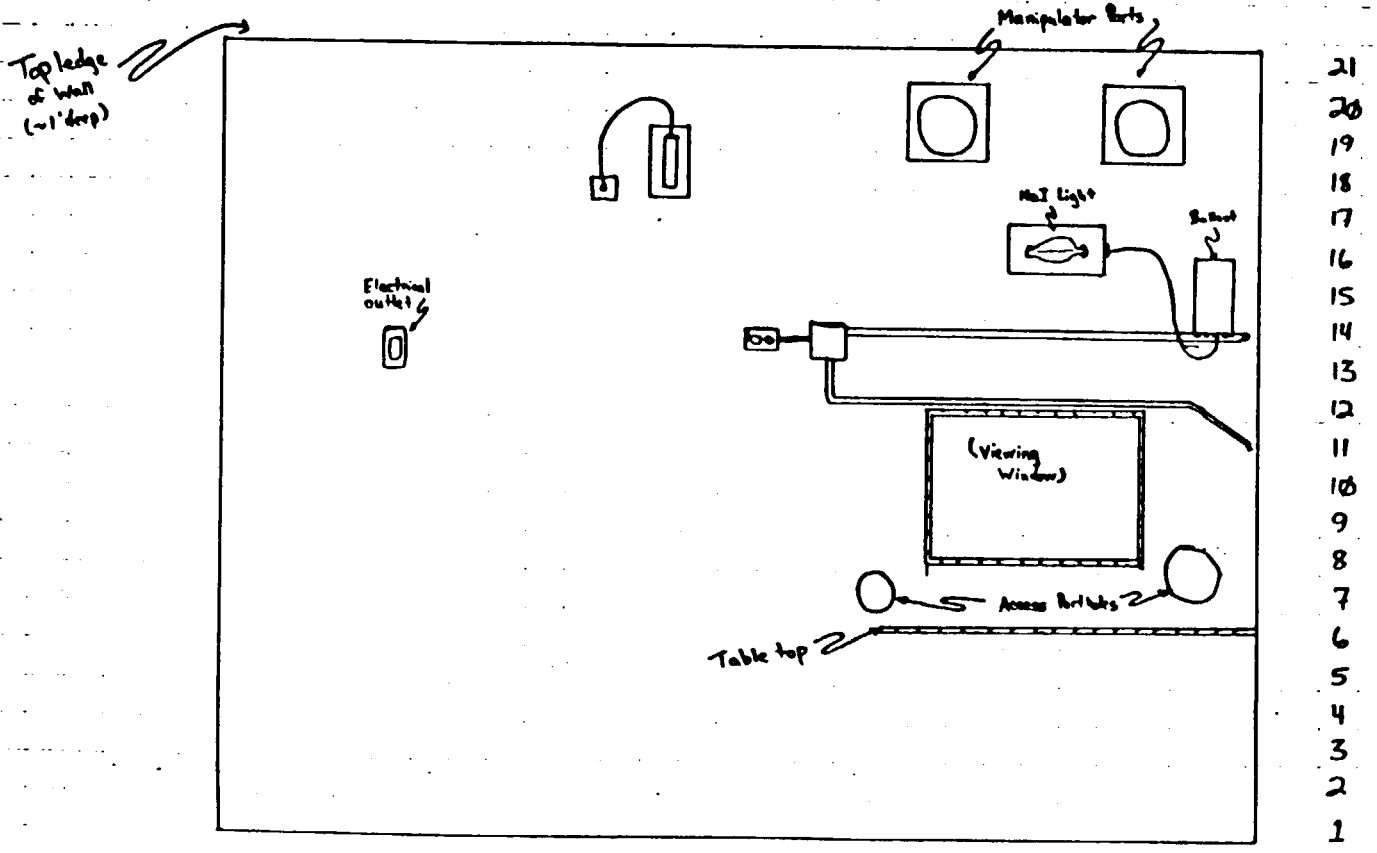
CHEM-NUCLEAR SYSTEMS, INC.

MAP #5
HOT CELL INTERIOR
South Wall



1/2" = 1 ft

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/7/86 | TIME START: 0834 | TIME COMPL: 1000 | PAGE 1 OF 1

ACTIVITY LOCATION: Hot Cell | SURVEYOR: D. Cornette | PHONE: 303 [illegible]

☒ NO ACTION REQ'D ☐ CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

COMMENTS: HOT CELL STUDY SURVEY (MAP #6 EAST, West WALLS)
MDA = [illegible] dpm/100 cm² NO = NOT DETECTABLE
① Cal. due date – 4 May 86

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2200 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2200 dpm/100 cm² BETA-GAMMA

☒ OTHER (SEE COMMENTS)

CONTAMINATION SURVEY	INSTRUMENT	ALPHA	BETA GAMMA
RADIATION SURVEY	INSTRUMENT	NEUTRON	BETA GAMMA
	[illegible]		MS-2 α/HP-210T
	472 (CDV)		PEM-7

INDEPENDENT RADCON REVIEW [illegible] DATE [illegible]

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE I.D.		Co^{60} #S3309	①
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1104 CPM	mR/hr
	SAT ☐ UNSAT ☐	SAT ☑ UNSAT ☐	SAT ☑ UNSAT ☐

BETA-GAMMA BACKGROUND (42 cpm) 310 dpm 0.015 mR/hr

REASON FOR SURVEY ☐ PROCEDURE – NO ☒ SPECIAL ☐ ROUTINE

SWIPE/ PROBE NO	ALPHA EQUIV Th²³² dpm/ PROBE	ALPHA EQUIV Th²³² dpm/ 100 cm²	BETA-GAMMA EQUIV Co⁶⁰ dpm PROBE	BETA-GAMMA EQUIV Co⁶⁰ dpm/ 100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
1				14.7	10	EAST WALL – Outside
2			ND	<MDA	10	A-11
3				66.4	12	B-7
4				29.5	10	C-8
5				22.1	10	G-6
6				73.8	10	H-10
7			ND	<MDA	10	J-6
8				73.8	10	K-2
9						
10						
11						
12						
13						
14						
15						
16						
17						

SWIPE/ PROBE NO	ALPHA EQUIV Th²³² dpm/ PROBE	ALPHA EQUIV Th²³² dpm/ 100 cm²	BETA-GAMMA EQUIV Co⁶⁰ dpm PROBE	BETA-GAMMA EQUIV Co⁶⁰ dpm/ 100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☒	ITEM OR LOCATION
18				7.38	12	West WALL – Outside
19				29.5	14	K-12
20			ND	<MDA	12	M-9
21			ND	<MDA	10	L-3
22				22.14	12	O-10
23			ND	<MDA	12	Q-4
24				51.6	10	T-8
25			ND	<MDA	12	R-11
26						S-12
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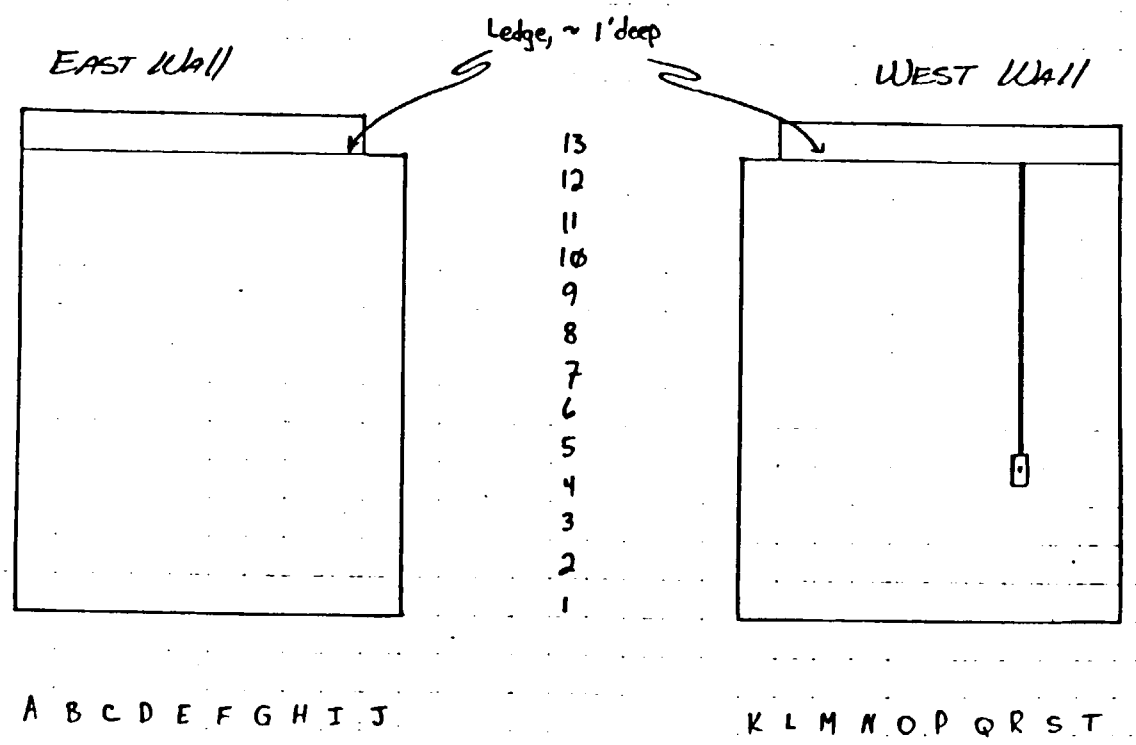
CHEM-NUCLEAR SYSTEMS, INC.

MAP # 6
HOT CELL EXTERIOR



1/4" = 1 ft

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/7/86 | TIME START: 1115 | TIME COMPL: 1210 | PAGE 1 OF 1

ACTIVITY/LOCATION: Ft. McClellan - Hot Cell | SURVEYOR: M. Manning / D. Comette | PHONE: (205) 256-0450

DAILY / WEEKLY / MONTHLY ☐ CONTAMINATION AND ☐ RADIATION SURVEY

☑ NO ACTION REQ'D ☐ CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

COMMENTS: Hot Cell Study Survey (Map # 7 - South Hot Cell Wall, cu/mile)
MDA 222 dpm/100cm² ND = NOT DETECTABLE
Ⓟ Cal. due date = 4 May 86

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2700 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2700 dpm/100 cm² BETA-GAMMA

☑ OTHER (SEE COMMENTS)

	CONTAMINATION SURVEY	INSTRUMENT	ALPHA	BETA-GAMMA
		623 (SN 1)		MS-2 W/HP-210T
	RADIATION SURVEY	INSTRUMENT 421 (CVS)	NEUTRON	BETA-GAMMA PRM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 2/20/86

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE ID		83369 (Co 60)	Ⓟ
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1104 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☑ UNSAT ☐	SAT ☑ UNSAT ☐

BETA-GAMMA BACKGROUND (42 cpm) 310 dpm 0.015 mR/hr

REASON FOR SURVEY ☐ PROCEDURE – NO ☑ SPECIAL ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	dpm/100 cm²	BETA-GAMMA EQUIV Co 60 dpm/PROBE	dpm/100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☑	ITEM OR LOCATION
1			129.52		8	G-5 Wall
2			ND (LMDA)		8	J-4 "
3			ND (LMDA)		8	J-6 " / piping
4			ND (LMDA)		9	M-5 Control Box
5			ND (LMDA)		8	N-3 Electrical Panel
6			ND (LMDA)		8	U-5 " "
7			127.14		12	Z-4 Wall
8			ND (LMDA)		8	W-2 "
9			ND (LMDA)		7	P-5 "
10			ND (LMDA)		8	J-8 "
11			ND (LMDA)		8	F-11 "
12			ND (LMDA)		10	C-9 "
13			127.75		8	J-11 "
14			ND (LMDA)		9	H-11 Manipulator Base
15			ND (LMDA)		8	R-10 Wall
16						
17						
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19						
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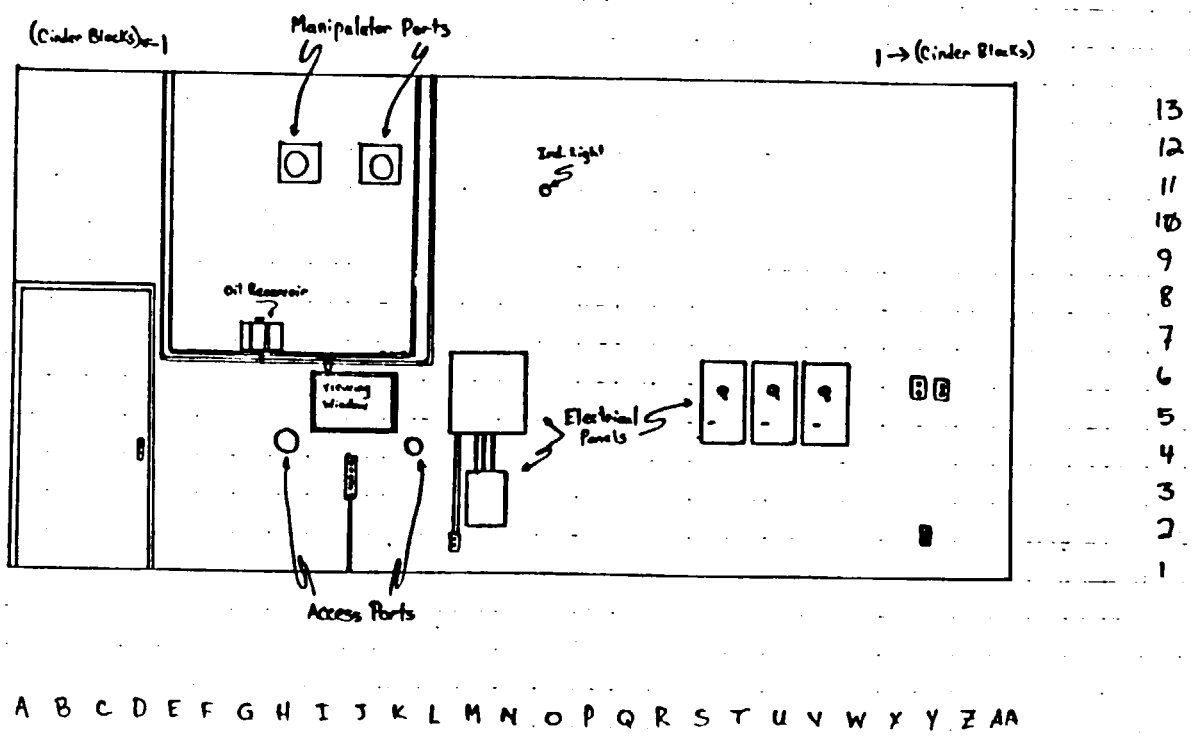
CHEM-NUCLEAR SYSTEMS, INC.

MAP # 7
HOT CELL EXTERIOR
South Wall



1/4" = 1ft

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/9/86 | TIME START: 1320 | TIME COMP.: 1430 | PAGE 1 OF 1

ACTIVITY/LOCATION: F7 McCallum Hot Cell | SURVEYOR: M. Manning / D. Cornette | PHONE: (803) 256-0150

DAILY WEEKLY MONTHLY — CONTAMINATION AND — DAILY WEEKLY MONTHLY — RADIATION SURVEY

☑ NO ACTION REQ'D ☐ CIRCLED READINGS — DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS
- ☐ < 220 dpm/100 cm² ALPHA
- ☐ < 2200 dpm/100 cm² BETA-GAMMA
- ☐ RESURVEY

CSOA AREA CONTROL LEVELS
- ☐ 220 dpm/100 cm² ALPHA
- ☐ 2200 dpm/100 cm² BETA-GAMMA

☑ OTHER (SEE COMMENTS)

COMMENTS: Hot Cell Study Survey (Map # 8 - Hot Cell Ceiling)
MDA = 227 dpm/100 cm²
① Cal. due date = 4 May 86

CONTAMINATION SURVEY	INSTRUMENT: 623 (NMV)	ALPHA	BETA-GAMMA: MS-2 w/HP210T
RADIATION SURVEY	INSTRUMENT: 122 (NVS)	NEUTRON	BETA-GAMMA: PRM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 2/2

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE I.D.		B 53009 (Co60)	
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1126 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☑ UNSAT ☐	SAT ☑ UNSAT ☐

BETA-GAMMA BACKGROUND (42 cpm) 315 dpm 0.015 mR/hr

REASON FOR SURVEY
- ☐ PROCEDURE — NO
- ☑ SPECIAL
- ☐ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co60 dpm/PROBE	BETA-GAMMA EQUIV Co60 dpm/100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☑	ITEM OR LOCATION
1			11870	400		A-5 Crane Frame
2			1879	420		B-9 Side of Crane Motor
3			18850	440		F-5 Side of drive Box
4			1886	300		D-1 Crane Frame
5			1233	300		D-3 Ceiling
6			13312	620		A-5 Power Cord reel
7			1180	220		K-9 Ceiling
8			198	100		Q-3 Mounting ridge
9			1150	260		X-7 Ceiling
10			1616	10000		BB-5 "
11			41500	440		F-6 Drive motor side
12						Note: Max. rad. level in cell = 30000 μR/hr
13						on Vent ducting near ceiling
14						
15						
16						
17						
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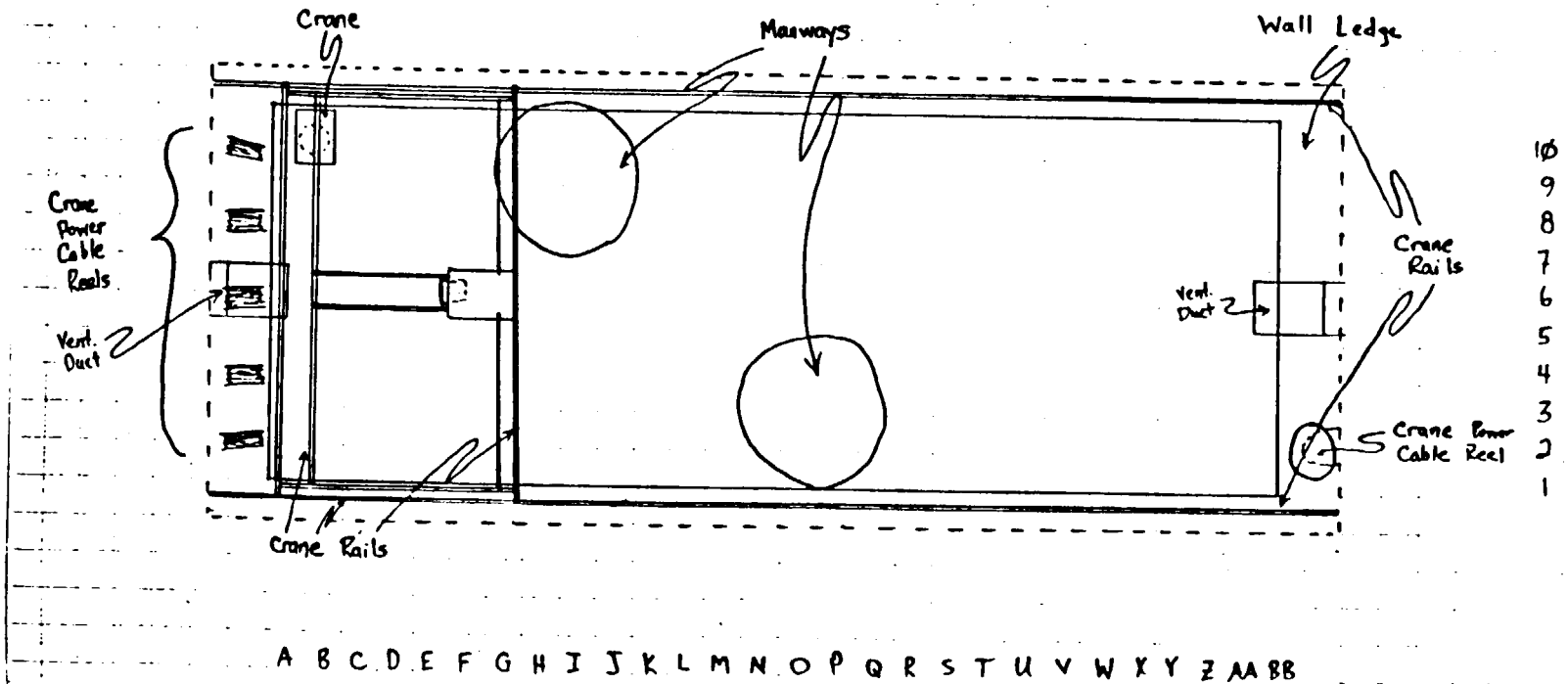
CHEM-NUCLEAR SYSTEMS, INC

MAP # 8
HOT CELL INTERIOR
CEILING



½" = 1ft

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

DATE: 2/9/86 | TIME START: 1300 | TIME COMPL: 1415 | PAGE 1 OF 2

ACTIVITY LOCATION: Ft. McClellan Hot Cell | SURVEYOR: A Manning / D Couette | PHONE: (205) 236-0450

DAILY WEEKLY MONTHLY [X] CONTAMINATION AND | DAILY WEEKLY MONTHLY [X] RADIATION SURVEY

[X] NO ACTION REQ'D [ ] CIRCLED READINGS – DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

COMMENTS: Hot Cell Study Survey (Map #9 Classroom overhead, Vent. ducts)
MDA = 0.222 dpm/100cm² ND = NOT DETECTABLE
① Cal. due date - 4 May 86

PERMISSIBLE LEVELS
[ ] < 220 dpm/100 cm² ALPHA
[X] < 2200 dpm/100 cm² BETA-GAMMA
[ ] RESURVEY

CSCA AREA CONTROL LEVELS
[ ] 220 dpm/100 cm² ALPHA
[ ] 2200 dpm/100 cm² BETA-GAMMA

[X] OTHER (SEE COMMENTS)

CONTAMINATION SURVEY	INSTRUMENT: 625 (Ser#)	ALPHA:	BETA GAMMA: AG-2 w/HP-210T
RADIATION SURVEY	INSTRUMENT: 452 (Ser#)	NEUTRON:	BETA GAMMA: TRM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 2/2/86

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE I.D.		#5309 Co60	①
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1126 dpm	mR/hr
	SAT [ ] UNSAT [ ]	SAT [X] UNSAT [ ]	SAT [X] UNSAT [ ]

BETA-GAMMA BACKGROUND (42cpm) 315 dpm 0.015 mR/hr

REASON FOR SURVEY: [ ] PROCEDURE – NO ____ [ ] SPECIAL [X] ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th dpm/PROBE	ALPHA EQUIV Th dpm/100 cm²	BETA-GAMMA EQUIV Co60 dpm/PROBE	BETA-GAMMA EQUIV Co60 dpm/100 cm	mrem/hr [ ] BETA-GAMMA [ ] NEUTRON [ ] MICRO R/hr [X]	ITEM OR LOCATION
1				233	18	#1 vent flue
2			ND	Lower Limit	18	#1 TRIM - Inside
3				263	20	#2 Vent Flue
4				203	19	#2 TRIM - Inside
5				150	17	#3 Vent Flue
6				75	19	#3 Trim - Inside
7				105	20	Return Duct - Right
8				7.51	19	Return Duct - Left
9				158	21	#1 Above Classroom on beam
10				1044	22	2 " " top of Wall
11				901	18	3 " " on beam
12				533	19	4 " " " "
13				533	20	5 " " on Roof
14				123	23	6 " " on Duct
15			ND	Lower Limit	22	7 " " on beam
16			ND	Lower Limit	22	8 " " on Ceiling pipe
17				894	20	9 " " on Beam

SWIPE/PROBE NO	ALPHA EQUIV Th dpm/PROBE	ALPHA EQUIV Th dpm/100 cm²	BETA GAMMA EQUIV Co60 dpm/PROBE	BETA GAMMA EQUIV Co60 dpm/100 cm	mrem/hr [ ] BETA GAMMA [ ] NEUTRON [ ] MICRO R/hr [X]	ITEM OR LOCATION
18				15	19	#10 Above Classroom on duct
19				668	30	11 Above hot Cell on beam
20				443	35	12 " " " " " of Roof
21				83	33	13 " " " on top of Wall
22			ND	Lower Limit	31	14 " " " on beam
23				435	29	15 " " " " "
24				1091	35	16 Above office on top of ~~ducting~~ beam
25				233	28	17 " " " " " ducting
26				1442	20	18 ~~Pipe~~ above ~~sink~~ shower
27				939	20	19 Top of bathroom wall
28				263	14	20 Pipe Top of wall
29				45	21	21 Top of Wall
30				676	23	22 Pipe up Wall
31				2005	30	23 Back of A.C. unit
32				90	20	24 Pipes back of A.C.
33				15	20	25 Top of office Wall
34				165	22	26 Ledge above office
35				68	20	27 A.C. vent
36				60	19	28 ledge Above office window
37			ND	Lower Limit	22	29 Wall Above office window
38				345	20	30 Pipe above sink
39				38	18	31 on chair
40			ND	Lower Limit	19	32 on chair

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CHEM-NUCLEAR SYSTEMS, INC

FORM 70132

CONTAMINATION/RADIATION SURVEY REPORT
CONTINUATION SHEET

TO: US ARMY

COMMENTS: Hot CELL Study Survey (Map #9 Classroom, Overhead, vents, duct)

ACTIVITY/LOCATION: FT McClellan Hot cell

SURVEYOR: M. Manning / D Cerrette

PAGE 2 OF 2

DATE: 2-9-86

NOTE: THE KNOWING & WILLFUL RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

SWIPE/PROBE NO.	ALPHA EQUIV. Th^{230} pCi/PROBE	ALPHA EQUIV. Th^{230} pCi/100 cm^2	BETA-GAMMA EQUIV. Cs^{137} pCi/PROBE	BETA-GAMMA EQUIV. Cs^{137} pCi/100 cm^2	mrem/hr. ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO r/hr. ☒	ITEM OR LOCATION
33				45	20	duct in office
34				25	20	duct in office
35			ND	~~CMAX~~ 3	18	under Floor tile
		DAILY SURVEY				
1				76	35	In control point
2				23	30	on Floor near Tools
3				30	20	on Floor by office
4				60	20	drum by steam hose
		OFFICE WEEKLY SURVEY				
1				45	20	Floor by desk
2.			ND	~~CMAX~~ 3	20	on desk
3.			ND	~~CMAX~~ 3	20	Floor by door
		Windows in Classroom				
W1			ND	~~CMAX~~ 3	18	Window sill
W2				72	16	" seal
W3				7.2	16	" Sill
W4				29	17	" Seal
W5			ND	~~CMAX~~ 3	15	" Sill

SWIPE/PROBE NO.	ALPHA EQUIV. Th^{230} pCi/PROBE	ALPHA EQUIV. Th^{230} pCi/100 cm^2	BETA-GAMMA EQUIV. Cs^{137} pCi/PROBE	BETA-GAMMA EQUIV. Cs^{137} pCi/100 cm^2	mrem/hr. ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO r/hr. ☐	ITEM OR LOCATION

AREA MANAGEMENT

SYSTEMS & PROCEDURES

CHEM-NUCLEAR SYSTEMS, INC

CHEM-NUCLEAR SYSTEMS, INC.

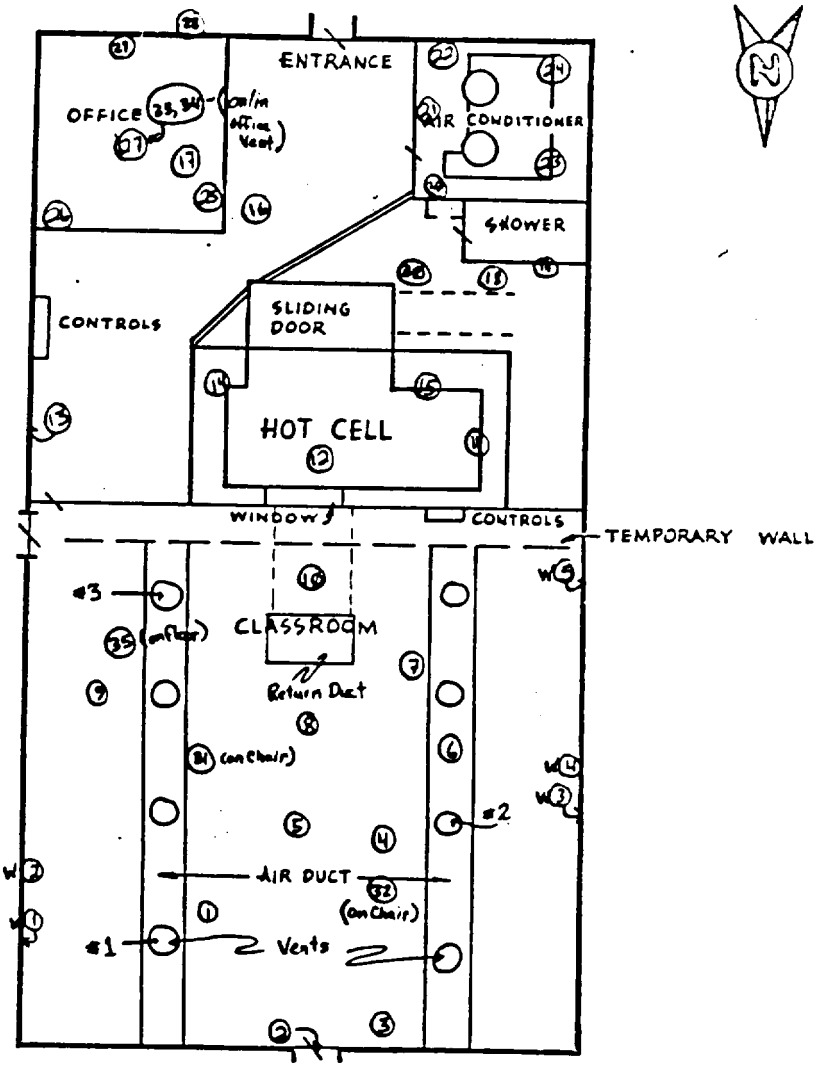
HOT CELL
BLDG 3192

MAP # 9

N/A

~~GENERAL LEVELS OF CONTAMINATION:~~

- ~~WALLS / CONTROLS 500 - 2000 dpm/cm²~~
- ~~RAFTERS & AIRDUCTS 1000 - 6000 dpm/cm²~~
- ~~ABOVE HOT CELL AS HIGH AS 70,000 dpm/cm²~~
- ~~CLASSROOM NOT CONTAMINATED EXCEPT AIR DUCTS~~
- ~~NO CONTAMINATION ON EXTERIOR WALLS OF BUILDING~~



– Swipe Locations Circled; see Survey report for exact Locations

CONTAMINATION/RADIATION SURVEY REPORT

TO: U.S. Army

ACTIVITY/LOCATION: Ft. McClellan Hot Cell

SURVEYED BY: M. Manning / D. Cemnette

PHONE: (205) 236-0450

DATE: 3/10/86 | TIME START: 0920 | TIME COMP: 1030 | PAGE 1 OF 1

☐ NO ACTION REQ'D ☑ CIRCLED READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☑ < 2200 dpm/100 cm² BETA-GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2200 dpm/100 cm² BETA-GAMMA

☑ OTHER (SEE COMMENTS)

DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND DAILY ☑ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

COMMENTS: Hot Cell Study Survey (Map & 10 - A/C unit)
MDA = [illegible] pr/100 cm² ND = NOT DETECTABLE
① Cal. due date - 4 May 86

CONTAMINATION SURVEY	INSTRUMENT: AP4-623	ALPHA	BETA GAMMA: MS-2 40/HP210T
RADIATION SURVEY	INSTRUMENT: CAM-U22	NEUTRON	BETA GAMMA: FIM-7

INDEPENDENT RADCON REVIEW: [illegible] DATE: 3/11/86

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA/GAMMA	RADIATION BETA/GAMMA
SOURCE ID		S-8309 Co 60	①
SOURCE STRENGTH	dpm	8143 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1125 cpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☑ UNSAT ☐	SAT ☑ UNSAT ☐
BETA-GAMMA BACKGROUND	(46 cpm)	332 dpm	0.015 mR/hr

REASON FOR SURVEY: ☐ PROCEDURE - NO ☐ SPECIAL ☑ ROUTINE

SWIPE/PROBE NO	ALPHA EQUIV Th²³² dpm/PROBE	ALPHA EQUIV Th²³² dpm/100 cm²	BETA-GAMMA EQUIV Co 60 dpm/PROBE	BETA-GAMMA EQUIV Co 60 dpm/100 cm	mrem/hr ☐ BETA-GAMMA ☐ NEUTRON ☐ MICRO R/hr ☑	ITEM OR LOCATION
1			ND	<MDA	26	B-14 on pipe
2				1433	30	E-15 in squirrel cage
3			ND	<MDA	34	H-9 on Front cells
4			ND	<MDA	32	O-15 in squirrel cage
5			ND	<MDA	36	N-11 between cells
6			ND	<MDA	34	S-5 between cells
7				136.1	34	S-8 Backside
8				1422	24	L-14 open vent - back
9				136.1	38	G-7 on door tray
10			ND	<MDA	24	DD-11 on cover
11				51	45	H-15 on squirrel cage
12						Hottest point found
13						F-15 inside squirrel
14						cage - 40-50 uR
15	Note: Decontaminated unit into					vent door (G→N-14
16	on (Map) Suspect it was shut & therefore					
17	was inaccessible for decon. earlier. Recommend:					
18				253	27	I→M-14 Vent door
19			ND	<MDA	32	J→N-14 Vent slots
20	Results ⇒					Decon. to Sat level(s) (<10000 dpm/100cm²)
21						
22						
23						Daily Survey at Control Sample area:
24	1550					Lab Co check = 47 cpm - Sat prem
25				51	24	1. Floor - by drum
26			ND	<MDA	50	2. Floor - by waste drum
27			ND	<MDA	20	3. Floor - under cart
28				65	20	4. cell step off pad - Front
29			ND	<MDA	24	5. Wall by Rad. Sign
30						
31						
32						MARSHALL UR reading
33						observed 60 uR bottom
34						inside waste drum
35						
36						
37						
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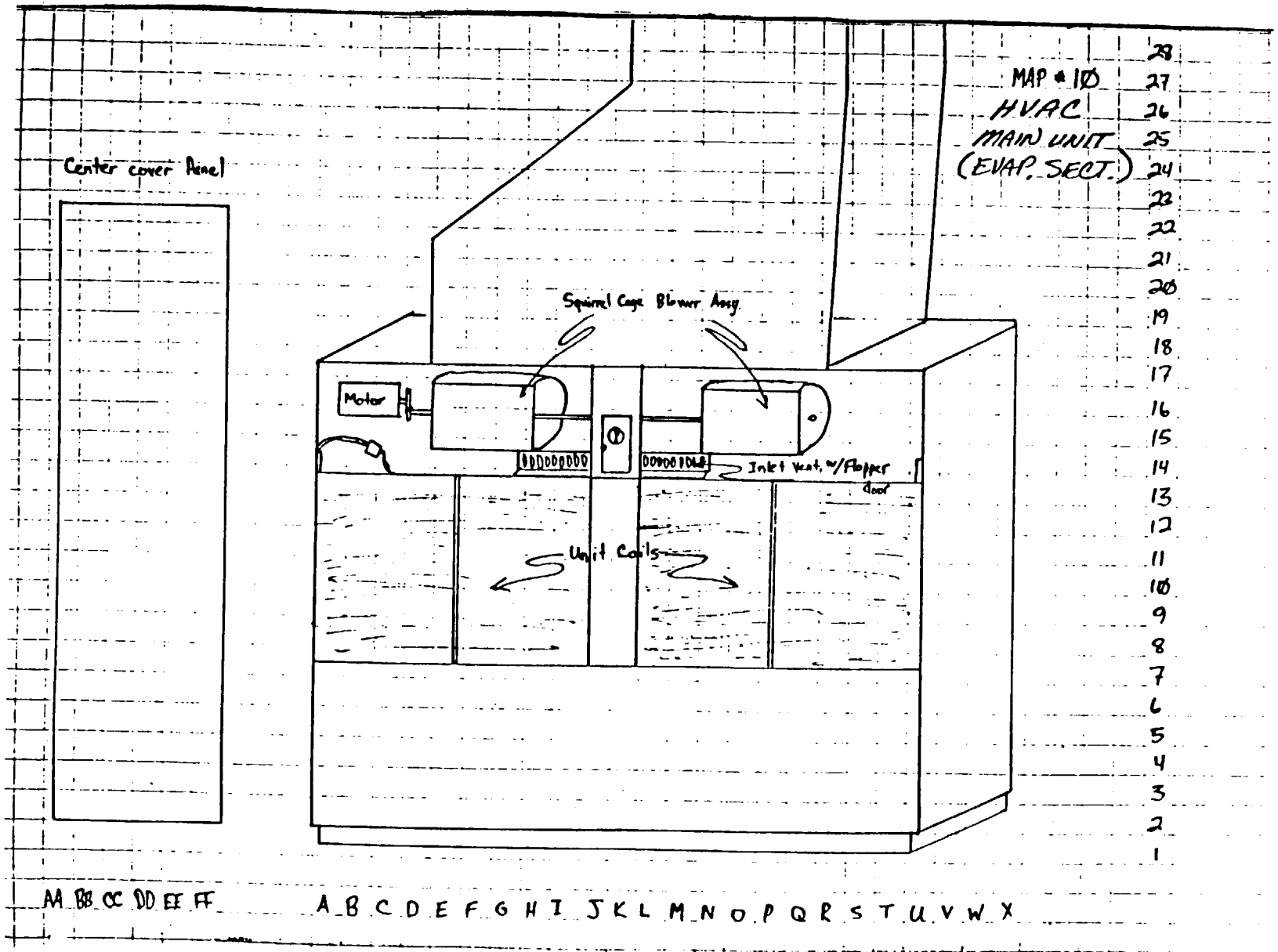
CHEM-NUCLEAR SYSTEMS, INC



CHEM-NUCLEAR SYSTEMS, INC.

CHEM-NUCLEAR SYSTEMS, INC

CUSTOMER Chem Nuclear System, Inc.
ADDRESS 220 Stoneridge Drive
CITY Columbia, SC 29210
ATTENTION Roger Johnson
INVOICE NO 603333

SAMPLES RECEIVED 03/25/86 | CUSTOMER ORDER NUMBER N438223

TYPE OF ANALYSIS Solid

Sample Identification	Type of Analysis	pCi/gram
1,600 Gallon Tank	Plutonium-238	0.12±0.01
	Plutonium-239	0.02±0.01
	Strontium-90	4.34±0.40
	Uranium-234	1.84±0.08
	Uranium-235	0.08±0.02
	Uranium-238	0.73±0.20
	Gamma Spectralanalysis:	
	Cesium-137	155±26
	Cobalt-60	335,000±65
	Zinc-65	159±53
100 Gl Tank Discharge Pipe	Plutonium-238	< 0.05
	Plutonium-239	< 0.05
	Strontium-90	< 0.03
	Uranium-234	< 0.05
	Uranium-235	< 0.05
	Uranium-238	< 0.05
	Gamma Spectralanalysis:	
	Cesium-137	8.76±1.29
	Cobalt-60	45,500±56
	Zinc-65	8.73±4.09

APPROVED BY
04/03/86 James J. Mueller, President

PAGE 1 OF 1 PAGE

Enclosure 3 of Part 1

cep
Controls for Environmental Pollution, Inc.
P.O. Box 5351 • 1925 Rosina • Santa Fe, New Mexico 87502
Telephone 505/982-9841

PART II

(Phase 3)

PROJECT REPORT

For

FORT MCCLELLAN, ALABAMA

DECONTAMINATION PROJECT

Prepared By Hilbert Associates, Inc.

For

Chem-Nuclear Systems, Inc.

1250J

TABLE OF CONTENTS

Cover Page

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1250J

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A. Radiochemistry Sample Data and Calibration sheets
B. Radioactive Waste Inventory Summary Sheets
C. Radiochemistry Results for Soil and Concrete
D. Final Radiological Survey Sheets

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D.4 Hot Cell Door
D.5 Top of Hot Cell in Building #3192
D.6 AC Ductwork in Building #3192
D.7 Top of Office Area in Building #3192
D.8 Truss Roof of Building #3192
D.9 Area over Classroom in Building #3192

Attachments

1. Drawing, Fort McClellan Hot Cell Facility and Fenced Exclusion Area

FINAL PROJECT REPORT

I. INTRODUCTION

A. Chem-Nuclear Systems, Inc. of Columbia, South Carolina issued a subcontract to Hilbert Associates, Inc. of Saratoga Springs, New York to implement the remedial actions described in this report.

B. Chem-Nuclear Systems, Inc. was under a separate contract for services to the U.S. Army Chemical School, Fort McClellan, Alabama.

C. The remedial actions described in this report provided by Hilbert Associates were under the direction of Mr. Greg Komp, Radiation Protection Officer of Fort McClellan and Mr. Roger Johnson, Program Director, of Chem-Nuclear Systems.

D. The activities described in this report were performed during the period of August 4, 1986 through September 2, 1986.

II. ENCLOSURES

Enclosure A Radiochemistry Sample Data and Calibration Sheets.

Enclosure B. Radioactive Waste Inventory Summary Sheet.

Enclosure C. Radiochemistry Results for Soil and Concrete.

Enclosure D Final Radiological Survey Sheets

III. ATTACHMENTS

1. Drawing, Fort McClellan Hot Cell Facility and Fenced Exclusion Area.

IV. BACKGROUND

A. The activities described in this report were performed within the fenced-in exclusion area directly behind (southerly from) the Military Police Museum, Building #3182. The fenced-in exclusion area includes Buildings #3192 and 3180.

B. Chem-Nuclear Systems drawing #SK-LAK-120685, Rev. A and later versions depict the areas discussed in this report.

C. Previous activities on the site performed by CNSI have been described in this report (Part 1) to the extent required to provide continuity of the program.

D. The original subcontract issued to Hilbert Associates in July 1986 provided for radiological engineering services in Building #3192 as listed below.

1. Removal or decontamination of installed building systems and structure surfaces to reduce the general areas within the building to less than 160 uR/hr.

2. Removal of all loose surface contamination to a level of less than 1000 dpm/100 cm^2.

3. Removal of fixed contamination on systems, components and building structural material, normally accessible that contribute significantly to background radiation levels.

4. Removal of Hot Cell installed HEPA ventilation system.

5. Removal of asbestos insulating materials on the building steam supply and condensate return piping systems.

6. Perform a building survey and sampling plan that would provide documentation of the building's prevailing radiological status when complete.

E. On August 11, 1986, a meeting was held to discuss changes and additions to the initial scope of work described in Paragraph D. above. In attendance at this meeting were Mr. Johnson from Chem-Nuclear, Messrs. G. Komp and J. Torres from Fort McClellan's Radiation Protection Group and Messrs. N. Hilbert and S. Miller representing Hilbert Associates, Inc. The changes and additions to the contract scope were authorized to extend contract activities to areas outside Building #3192. These changes were intended to provide the entire fenced-in areas with the optimum radiological condition with available funding. The key elements of the contract scope changes are listed below.

1. The two underground tanks, 100 and 1500 gallon capacities had been excavated and left above-ground on the concrete pad. The open excavation was water filled from rain. The water in the excavation was planned to be pumped out and residual soil sampled at the bottom of the excavation to allow for eventual backfill. The drain piping from Building #3192 and into the Piping Pit had been cut and capped.

2. The two tanks, 100 and 1500 gallon capacity were to be prepared for shipment as radioactive waste.

3. Building #3180, a small concrete structure previously used as a radioactive source storage vault, exhibited a significant level of loose and fixed contamination. The change in scope was to decontaminate this structure to the maximum extent possible.

4. Provide for removal of water from the old concrete valve and piping pit, perform survey and sampling of internal areas for decontamination feasibility to the extent possible.

5. Perform radiochemistry analysis on the inventory of packaged soil samples obtained previously from the grid plan and plot same. The purpose of this sampling plan is to provide a composite of all samples on a plot grid system that identifies the extent of soil contamination.

6. Excavate and remove the contaminated soil just outside the access gate on the easterly side of the concrete driveway. This contaminated soil beyond the fenced area affected an area of approximately 40 to 50 square feet. Earlier site activity had removed part of the contaminated surface soil.

V. GENERAL INFORMATION

A. Personal dosimetry was worn by all Hilbert Associates employees while engaged in this project. The dosimetry was provided by Chem-Nuclear Services.

B. Decontamination Technician and Radiological Control Technician training for employees engaged in this project was provided by Hilbert Associates.

C. Physical/medical examinations required for radiation area workers including respiratory equipment users was provided by Hilbert Associates.

D. All portable radiation detection instruments used on this project was maintained in calibration to NBS traceable sources and standards.

E. The radiochemistry was performed by a Canberra 35 MCA System using a 2" x 3" NaI detector. The results of these sample analyses are included in this report by print-outs coordinating samples to respective plot grids. Radiochemistry results obtained previously by others are included in the print-outs to consolidate all known radiochemistry results.

F. Portable ventilation and vacuum cleaning systems were DOP tested prior to use on this project.

G. Site grid plans, radiochemistry data, radiological survey results and a tabulation of radioactive waste prepared for transport and disposal are provided as Enclosures and Attachments to this report.

VI. PROJECT ACTIVITIES - BUILDING # 3192

A. Site mobilization was affected on August 4th with personnel and equipment. Within three working days, all equipment was operational and initial entry surveys completed.

B. Elimination of the contaminated asbestos was the first production task in Building #3192. The asbestos pipe covering, in a deteriorated condition, was limited to steam and condensate lines in the building northerly (entry) areas and the heating

and air conditioning room. The asbestos removals were performed using total containment bags with workers using protective clothing and respirators.

1. Approximately 150 linear feet of radioactive contaminated asbestos pipe insulation was removed.

2. Local HEPA ventilation and vacuum systems were employed continuously during all removal operations.

3. Approximately twenty (20) cubic feet of waste was generated during this operation.

4. During the removal phase all pipe insulation was maintained in a wetted condition. Following the removals, all piping runs were wiped down and the entire work space vacuum cleaned.

C. The building installed HEPA ventilation system servicing the Hot Cell only was removed and packaged as radioactive waste.

1. The system was cut and capped at the two cell suction ducts on top of the cell. The duct work transaction through the ducts inside the cell were not removed.

2. The entire duct work between the cell top concrete transitions and HEPA filter assembly were cut up for optimum radioactive waste packaging.

3. The HEPA filter assembly was removed and disposed of as radioactive waste. It was apparent from direct measurements and swipe surveys that the HEPA filter had been compromised and the internal duct contamination extended downstream into the blower unit and building exhaust pipe.

4. The HEPA system blower (fan) unit was removed and packaged as radioactive waste.

5. The HEPA exhaust and building roof discharge pipe was removed and packaged as radioactive waste.

6. The building roof was provided with a sheet metal patch and tarred as a temporary closure.

D. The building attic areas above the classroom were previously provided with a plywood closure with access doorway. This access is from above the hot cell and was entered for sampling and surveys.

1. The fiberglass insulation over the classroom tiled ceiling exhibits low levels of radioactive contamination in the form of dust. The building trusses and beams also exhibit low levels of loose surface contamination. Contamination surveys indicated from less than 1000 dpm to 4000 dpm per 100 cm^2.

2. The contamination levels are the highest at the northerly (access) end and diminish as swipe surveys progress to the southerly end of the building.

3. There is no walkway or decking in this area (safety consideration) and radiological controls should be imposed for future entry.

E. The building trusses and beams in the northerly end of the building are open over the cell, office, air conditioning/heating room and building entryway. This area was decontaminated to the extent possible without erection of scaffolding. It should be expected that loose contamination is

probable at low levels on structural sills, plates and beams supporting the roof panels which were not readily accessible during this decontamination effort. Of the truss system surveyed (Enclosure D.8), low levels of fixed and loose contamination was found after an initial wipedown. However, the contamination on wood and metal surfaces is tenaciously bound and redistribution is not probable under normal air flow on building access conditions.

F. The air conditioning/heating room was surveyed and does not exhibit areas of loose surface contamination.

1. The installed air conditioning system itself which includes system framework, ducts, squirrel cage blowers, flow adjusting dampers and diffusers all exhibit low levels of fixed and loose surface contamination on internal surfaces. The system was not disassembled for decontamination.

2. The diffusers and air return inlet screen in the classroom area was removed and discarded as radioactive waste. Plywood blanks were installed at these system access points and posted as internally contaminated. Maximum removable contamination found at these access points was approximately 1500 dpm per 100 cm^2.

G. The shower area adjacent to the air conditioning room is free of loose surface contamination. The floor drain which has been plugged with concrete indicated significant above background counts. This drain line is below the building concrete floor and must be common with a similar concrete plugged drain line under the hot cell doorway trench. This drain line was also plugged outside the building, below grade, at the time of the 100 and 1500 gallon tank removal.

H. The hot cell was cleared of radioactive scrap and waste materials and subject to extensive decontamination efforts. Upon termination of the decontamination work the following listing describes the cell current radiological status. Radiological controls should continue to be imposed for cell entry.

1. The source storage tubes with shielded plugs were not opened and the current status of these tubes is unknown.

2. The installed hoist system was surveyed and decontaminated to a limited extent. This system was not operational and the hoist drum, cable, blocks, power cables and spools could not be made accessible. The electrical power cables indicate higher levels (710,000 dpm) of fixed contamination impregnated into the insulation.

3. The manipulator arms were also surveyed and decontaminated. The final surveys indicate no loose contamination.

4. The mirror assembly, doorway bridge beams and four wheeled cart were removed from the cell, decontaminated and surveyed. Evidence of fixed contamination remain on these items. These items were returned to the cell upon completion of the cell internal decontamination.

5. The cell internal surfaces that are normally accessible were swipe surveyed and indicate less than 1000 dpm/100 cm^2. In general these surfaces could not be subject to direct surveys for fixed contamination because of the high background emanating from the two ventilation system exhaust ducts still installed in the cell.

6. The area in the trench between the building floor and cell floor exposed when the door is fully open was found to be highly contaminated. This contamination was both loose and fixed in excess of 100,000 dpm. This concrete area was stripped clean of paint and the surface layer of concrete removed with air operated needle guns. The only indication of residual radioactivity is now emanating from the concrete trench area drain which is plugged with concrete.

   The inaccessible areas of the trench with the door open or shut are still considered to be contaminated. The cell door, open or closed, has inaccessible areas on the bottom, top and inside surfaces, which must be considered as potentially contaminated.

I. The classroom area was not subject to 100% swipe surveys. Of those major swipe surveys performed none provided indications of loose surface contamination except for the ventilation diffusers. The classroom along with corridors, entryways and the office were surveyed with portable uR instruments and no significant general areas above background were detected.

J. The 55 gallon drums of radioactive dry waste materials in the building at the onset of this task were repackaged as radioactive waste. The two 55 gallon drums of liquid waste and sludge were solidified in concrete and prepared for waste shipment. The total radioactive waste inventory prepared for shipment at the completion of this task is provided as Enclosure B to this report.

VII. PROJECT ACTIVITIES - BUILDING # 3180

A. Historically this building was used as a radioactive materials and source storage vault. At some time a significant loss of containment and spread of radioactive material occurred resulting in extensive contamination of the vault floor and entry threshold. Some decontamination may have been performed prior to this task. This spread of radioactivity may have been the source of the residual contamination still apparent along the expansion joints in the concrete aprons and joints adjacent to Building #3180.

1. Building #3180 contained an assortment of scrap material, metal shelves, steel materials and record books. The entire building contents were removed and surveyed. The radioactive materials were packaged as waste and non-contaminated items discarded as scrap material. The record books were found free of contamination and relocated to the Building 3192 classroom area.

2. The major contaminated area in this building was the concrete floor. Decontamination of the floor, doorway threshold and 2' x 2' concrete pedestal in the northwest corner was attempted using air driven scabblers and needle guns. The concrete surface scabbling continued to a point where 1/4 to 1/2 inch of concrete had been removed. Two areas of about one foot square and readily detectable with portable instruments were sampled for radiochemistry analysis. The MCA results of these two samples were 551 and 2868 pCi/gram of Cs137.

3. The final swipe surveys were all less than 1000 dpm/100 cm^2. General area dose rates are documented in Enclosure D.1.

VIII. PROJECT ACTIVITIES - 100 AND 1500 GALLON TANKS

A. Upon site mobilization the 100 gallon and 1500 gallon tank were positioned on the concrete apron adjacent to the concrete loading dock. These two holding tanks had previously been the Building 3192 drain system. Originally the two tanks were piped in series between the building and a concrete piping/waste processing system pit just south of the loading dock. The piping system had been cut and capped in the effluent line from the building and at the inlet lines into the piping pit.

Sections of piping removed during this tank excavation were already packaged in a 96 cubic foot metal strong tight container along with some radioactive soil. The work scope change discussed implemented the disposal of these tanks as radioactive waste. Initial inspection of the 1500 gallon tank showed several points (1/8 to 1/4 inch holes) of total rust through of the carbon steel plate.

B. A wooden strong tight container was fabricated for the shipment of the 1500 gallon tank. The wooden strong tight container was designed for a 7500 pound payload and fitted with a tank holding cradle and steel strap tiedowns.

C. With the 1500 gallon tank in the strong tight container and the cover (top) not installed, the tank top was cut open for loading of additional radioactive waste. Portland cement was added to the small amount of liquid sludge in the tank bottom. In addition to several bags of radioactive waste materials, the following major items were inserted into this tank to optimize the space utilization and burial costs.

1. Building #3192 HEPA ventilation system in its entirety
2. The 100 gallon tank.
3. The submersible sump pump from the valve pit.

The void spaces between the strong tight container and the tank exterior were also used for waste packaging. A temporary wooden panel was banded over the tank cut-out area and the wooden container cover was installed.

D. The strong tight container was equipped with wire slings, painted, stenciled and weighed in preparation for shipment. This item appears as Item #11 of Enclosure B.

IX. PROJECT ACTIVITIES - TANK EXCAVATION AREA

A. Restoration of this area was discussed previously in this report. The excavation area location included positions of grid numbers E-101, E-111, E-112, E-120 and E-121. The open pit was partially filled with rain water to depths of about five feet. Because of the clay content of the sub soil, water percolation from the pit was not apparent.

B. The standing water in the open excavation was sampled and found to be free of radioactivity. A pumping system was installed for direct discharge to the storm drain system with back up sampling during the pumping operations. All sample radiochemistry results were negative.

C. Following the water removal from the open excavation, soil samples were obtained from the excavation area with negative radiochemistry results. These samples included the area adjacent to the footings of the pipe pit concrete structure.

D. The open excavation was backfilled to grade level using the soil excavation previously removed during the tank removal operations.

X. PROJECT ACTIVITIES - VALVE CONTROL PIT

A. The valve control pit is a concrete structure extending below grade approximately fourteen feet including its footing. The pit extends above ground about two feet and is covered with a shed roof with an access hatch. The base of the pit appears to be at the same below grade level that the removed 1500 gallon tank was previously situated. This piping pit is identified on some drawings as control pit and is located at the intersects of grid numbers E-121, E-122 and B-30. The piping system(s) contained within the pit had been removed prior to the activities discussed in this report. The piping penetrations through the easterly and westerly walls still remained in the concrete but had been cut and capped.

B. Upon initial inspection and pit entry, the pit contained about two feet of water. The water was sampled and analyzed for radioactivity with negative results and discharged to the storm sewer system. The residual silt remaining after pumping was analyzed and found radioactive. The results were 131 pCi/gm (Co60) and 42 pCi/gm (Cs137). It was noted that the pit internal water level returned to about two feet in depth overnight; however, no breach in the structure wall was observable.

C. The north-easterly corner of the pit contains a shallow sump and a non-operational pump was still installed. This pump and motor were removed and were included in the material prepared for the radioactive waste shipment.

D. The capped pit discharge piping (westerly side) is still installed underground and leads to the sewer manway located to the westerly in grid E-130. The pipe effluent end of the sewer manway has been plugged. The radiochemistry results of sampling previously performed in the sewer manway are provided in Enclosure C.

XI. PROJECT ACTIVITIES - PLOT GRID SYSTEM AND RADIOCHEMISTRY SAMPLING

A. During previous site activities in the fall of 1985, a grid system was established within the site perimeter fencing. The grid coordinates were provided with wooden stakes in the soil areas and the concrete aprons were marked with paint at the grid intersect points.

Some staked intersect points were removed during the tank excavation and others were missing from Drawing #SK-LAK-120685 this system could be re-established. Some concrete intersect points were removed previously during concrete removals to facilitate new air condition equipment pads for Building #3182. Other concrete grid intersect points have weathered and are no longer discernible. This marking system also could be re-established.

It was during the fall of 1985 activity period that a limited survey program was performed with portable instruments and some soil samples forwarded to an outside vendor for radiochemistry analysis. These vendor radiochemistry results can be identified by sample location in Enclosure B and are prefixed by "CEP."

In addition a large number of grids were sampled and samples packaged and stored in Building #3192 for future reference. All of these stored samples along with those acquired during this period were analyzed and are included in Enclosure B.

B. The Cs-137 contamination of greatest magnitude appears in the area of Building #3180 which is situated on the concrete apron area behind Building #3182 (museum). Again rain run-off spread radioactivity to the concrete expansion joints along the apron, adjacent building and curb areas.

The presence of both Co-60 and Cs-137 in outside areas (Attachment 1) may have resulted from normal migration in rain water run-off and erosion. Presence of both isotopes in the removed piping system, pipe pit and sewer manway indicate some Cs-137 was discharged into the system.

C. The drawing of Attachment 1 has been prepared with shaded areas to illustrate known areas of above background radioactivity. These shaded areas were developed from surveys with portable instruments and radiochemistry sampling during the activity period and data available from prior site remedial action efforts. The results are based on gamma characterization of soil samples for Cs-137 and Co-60.

D. During this site activity period, these areas indicating higher levels of soil contamination were subject to minor excavation and soil removals.

1. The area adjacent to the concrete driveway in grids A-78 through A-81.

2. An area in grid A-100 adjacent to the concrete loading dock.

3. An extended area outside the perimeter fence gate to the easterly side of the driveway. This outside area had been identified by previous survey information. Approximately 30 ft^3 of soil was removed from this area and a final composite soil sample of 4 pCi/gm (Co-60) and 2 pCi/gm (Cs-137) was recorded.

   Soil contamination in this area is still discernible with portable low level detection instruments. The levels detectable would indicate the radioactivity concentrations to be less than 10 pCi/gram.

   This area again was in the direct path of normal rain water run-off in a northerly direction.

XII. PROJECT SUMMARY - BUILDING #3192

A. The final building #3192 general area survey data is provided as Enclosure D.1 to this report. This survey was performed with a Ludlum, Model 19, uR instrument. Values of 12 uR/hr or less should be considered background levels. No general areas in the building exhibit levels of 50 uR/hr or greater which is the current DOE guideline limit for personnel exposure/access controls. Based on the general area survey data, personnel would not require dosimetry for building access.

Of note, the slight increase in uR/hr levels in the air conditioning room and shower room validates the known residual fixed contamination in the building air conditioning and heating system and shower floor drain.

B. The classroom area was subject to an extensive swipe survey at the start of the project activities. All swipe surveys indicated levels less than 1000 dpm/100cm^2. The only radiologically controlled work performed in this area was the solidification of sludge and water and limited rad-waste packaging. Subsequent to the controlled work additional swipe surveys were performed and levels were less than 1000 dpm/100 cm^2.

C. The areas in the cell entrance end of this building were utilized as a radiological controlled work area and posted as a "Controlled Surface Contamination Area (CSCA)". Upon completion of the workplace a final swipe survey was performed. This survey is included as Enclosure D.2.

D. The hot cell area was decontaminated to the maximum extent possible, but limited radiological controls should be imposed for entry. The final hot cell survey is included as Enclosure D.3 to this report. Posting of the survey data is recommended at the cell or for review by personnel prior to entry.

E. Final radiation and contamination survey sheets for the areas discussed above and other areas which were subject to decontamination and radiological survey are listed below and presented as Enclosures to this report.

Enclosure D.1	Building #3192 Radiation Survey
Enclosure D.2	Release of Building #3192 from CSCA Status
Enclosure D.3	Hot Cell
Enclosure D.4	Hot Cell Door
Enclosure D.5	Top of Hot Cell in Building #3192
Enclosure D.6	AC Ductwork in Building #3192
Enclosure D.7	Top of Office Area in Building #3192
Enclosure D.8	Truss Roof of Building #3192
Enclosure D.9	Area over Classroom in Building #3192

XIII. RECOMMENDATIONS

The Fort McClellan Facility has undergone decontamination activity to date which has resulted in an essentially unrestricted access condition for Building #3192 and environs for both dosimetric and removable contamination concerns. However, discrete areas, as noted in this report, are yet subject to radiological entry requirements. Recommendations for further remedial action are discussed below and, of course, are subject to cost considerations for potential work relative to the intended future utilization of the facility.

A. BUILDING #3192

The following spectrum of decontamination activity can be considered if unrestricted radiological release of the facility is desired.

1. Removal and packaging of office area insulation.

2. Removal and packaging of building air conditioning system in its entirety. The A/C handling unit would be segmented and removed. Portions of ductwork, when segmented, could be internally decontaminated and the tar paper external covering removed. Direct readings on tar paper covering were as high as 20,000 dpm/probe where removable contamination was noted. Most of the externally deposited radioactivity is fixed in the tacky surface of the A/C covering.

3. Access to the roof truss system would require scaffolding for thorough decontamination wipedown. Direct readings, where measured due to limited accessibility during prior operations, ranged from less than 1000 dpm/probe to 8000 dpm/probe in a random distribution. One direct reading was 60,000 dpm/probe. Scaffolding would allow unlimited access to the truss system, A/C ductwork and other overhead fixtures. Evidence of random removable contamination in the overhead fixtures exists with measured values of from less than 1,000 dpm/100cm^2 to 7500 dpm/100cm^2. As stated previously, normal decon (damp wipedown) methods are not particularly effective since the contamination is fairly adherent to the surface (See Enclosure D.8).

4. Removal and packaging of insulation material over classroom, due to the presence of low level removable contamination.

5. The cell door trough, with the cell door in the closed positioned, may require small area concrete scabbling. Exclusive of the cell itself, and the shower and door trough drain lines currently plugged with concrete, the above items, performed in conjunction with radiological surveys and documentation, would result in an unrestricted radiological release of the building exclusive of the hot cell.

6. If the hot cell were considered as an element of decontamination activity, more significant equipment removal, packaging and concrete scabbling would be effected. The majority of surfaces within the cell are currently decontaminated to less than 1000 dpm/100cm^2. However, inaccessible areas do remain such as wrist gears in manipulators, motor and gear assembly over crane, cable reels, bell housing over crane cable, source storage tube internals and remaining portions of ventilation exhaust ductwork, all of which should be removed and packaged for disposal. A typical residual level of fixed contamination is 50,000 dpm per probe on electrical rubber cable. Some areas found within the cell were as high as 300,000 dpm/100 cm^2 prior to this decontamination activity.

7. Significant effort would be expended to excise the contaminated drain lines from under the building to the capped underground ends external to the building, if required.

B. BUILDING #3180

1. The source storage building could be totally decontaminated with probable removal of the internal floor and threshold and other miscellaneous scabbling of concrete surfaces. Final release would be subject to residual concrete and soil sampling and gamma scintillation survey. Exterior surfaces of the building are not expected to be contaminated but are subject to radiological survey.

C. VALVE CONTROL PIT

1. The valve pit, like the source storage building, could be totally decontaminated with concrete floor scabbling and probable removal of the sump. Current pipes penetrating the walls should be removed and all piping should be removed from the pit. With reasonable effort, the pit status after these operations should allow for backfill and covering with clean fill. No indications of externally deposited radioactivity was seen in recent operations.

D. MANWAY WITHIN EXCLUSION AREA

1. The existing manway should be cleaned and existing contaminated sludge removed. Lines open to the manway have been plugged. The manway can be taken out-of-service and interior backfilled.

E. CONTAMINATED SOIL

1. The existing residual soil contamination resides in primarily the upper few inches of the surface and can be easily removed for packaging. Using the distribution shown on the attached drawing to this report, the contaminated soil is essentially confined to areas adjacent to concrete pads where water runoff patterns occurred. Soil removal to a maximum 6" depth in the indicated localized areas would result in probable total removal of all soil having radioactivity concentrations greater than 10 pCi/gm. Final soil sampling after soil removal would be required for documentation. A micro R or other gamma scan is also recommended for final documentation.

F. INTERNALLY CONTAMINATED UNDERGROUND LINES

1. Removal and segmenting of major portions of underground lines within the exclusion area fenceline is recommended particularly where industrial digging equipment could be used to expose underground lines. Remaining line segments should be plugged, capped and noted on detailed site drawings as internally contaminated underground piping.

ENCLOSURE A(18 pages)

SAMPLE ANALYSIS DATA SHEET

PAGE 1 OF 18

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						CO60	CS137	co int	cs int	bkgd co/cs
	A-94 1'	MARWELL SOIL	STORED SAMPLES	8/7/86	595	2.0± 0.8	1.9±	78	195	<CPS> 0.34/0.94
	A-95 1'				584	0.9±	1.1±	54	152	
	A-100 1'				621	13.3± 1.6	62.4± 1.	339	3544	
	A-101 1'				572	2.9± 0.9	4.1±	95	301	
	A-102 1'				595	<0.6	0.6±	43	128	
	A-100 3'			8/11/86	551	6.6± 1.3	26.8±	169	1425	<CPS> 0.34/0.94
	A-107 1'				536	1.6±	1.0±	66	140	
	A-69 1'				313	6.9±	2.3±	114	157	
	A-100 2'				551	13.1±	59.4±	301	3008	
	A-93 1'				607	1.4±	1.0±	65	147	
11	A-62 1'				644	<0.5	<0.4	41	94	

see EFF calibration data for 8/7 & 8/11/86

CHEM-NUCLEAR SYSTEMS, INC.

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
	B-38 1'	MARINELLI SOIL	STORED SAMPLES	8/11/86	658	0.6±	0.8±	49	149	(95) 0.34/0.94
	C-50 1'				518	<0.6	<0.4	37	93	
	E-139 2'				651	<0.5	0.9±	38	149	
	B-38 2'				632	<0.5	<0.4	47	115	
	E-129 2'				644	1.3±	0.7±	67	136	
	B-38 3'				662	0.7±	0.6±	52	127	
	D-25 1'				538	<0.6	<0.4	38	72	
	C-33 1'				735	<0.5	0.7±	32	140	
	D-27 1'				711	0.6±	0.9±	50	148	
	D-23 1'				705	<0.4	<0.3	33	67	
22	C-51 1'				661	0.6±	<0.4	48	114	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
	A-101 2'	MARINELLI SOIL	STORED SAMPLES	8/11/86	575	1.6±	0.9±	67	142	<(pS) 0.34/0.94
	A-102 3'				580	0.9±	0.8±	53	136	
	A-30 1'			8/12/86	333	<1.1	1.4±	41	139	<(pS) 0.42/0.98
OLD ID	O-5 3' UNDER PAVEMENT				409	<0.8	<0.5	25	77	
	B-36 3'				709	<0.5	0.65±	34	132	
	C-32 2'				619	<0.6	<0.4	35	84	
	A-92 1'				623	<0.6	0.65±	38	134	
	D-3 2'				551	<0.7	<0.4	23	84	
	C-32 3'				645	<0.6	<0.4	36	102	
	D-21 1'				348	<1.1	0.7±	43	120	
33	C-23 3'				674	<0.6	0.45±	47	125	

see EFP calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

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CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						C060	CS137	co int	cs int	bkgd co/cs
	D-18 3'	MARANELLI SOIL	STORED SAMPLES	8/12/86	660	<0.6	0.62±	53	135	
	A-76 3'				620	<0.6	<0.4	37	81	
	A-77 2'				517	<0.7	<0.5	31	85	
	A-107 2'				592	0.82±	1.6±	60	180	
	A-102 2'				515	<0.7	0.56±	54	131	
	A-30 2'				663	3.0± ~~0.41±~~	3.2±	116	285	
	A-93 2'				679	0.80±	1.3±	62	178	
	D-21 3'				539	<0.7	<0.4	37	92	
	A-94 2'				572	0.80±	1.1±	59	153	
	B-36 2'				688	<0.6	<0.4	40	99	
44	A-62 2'				618	<0.6	<0.4	28	98	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI **fort mcClellan**

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						C060	CS137	co int	cs int	bkgd co/cs
	A-95 3'	MARINELLI SOIL	STORED SAMPLES	8/12/86	603	<0.6	<0.4	42	110	
	D-26 2'				650	0.95±	1.9±	65	207	
	A-94 2'				567	<0.6	<0.4	28	115	
	A-77 1'				697	<0.5	<0.3	48	118	
	A-95 2'				484	2.0±	1.6±	78	168	
	D-23 2'				661	<0.6	<0.4	34	111	
	D-5 1'				483	<0.8	<0.5	39	73	
	A-92 3'				527	<0.7	<0.5	44	110	
	D-25 2'				789	<0.5	<0.3	46	105	
	A-107 3'				690	1.6±	1.2±	82	170	
55	A-94 3'				614	1.6±	1.5±	78	162	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
	D-1 1'	MARINELLI SOIL	STORED SAMPLES	8/12/86	307	<1.2	<0.8	24	55	
	A-101 3'				625	<0.6	0.86±	41	146	
	D-7 2'				520	<0.7	<0.5	17	75	
	A-77 3'				726	<0.5	<0.3	27	87	
	D-5 2'				416	<0.9	<0.6	27	77	
	D-1 2'				519	<0.7	<0.5	34	84	
	D-15 2'				1101	0.52±	0.54±	63	151	
	D-15 3'				1089	<0.3	0.46±	33	143	
	G-27 1'				698	<0.5	<0.3	36	105	
	A-101 1'				524	2.3±	3.4±	86	256	
66	D-25 3'				1141	<0.3	0.33±	36	132	

see EFF calibration data for 6/1/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - CO60	CS137	co int	cs int	bkgd co/cs
	D-7 3'	SIMPINELLI SOIL	STORED SAMPLES	8/12/86	889	<0.5	0.33±	39	122	
	E-139 1'				222	<1.7	<1.0	22	80	
OLD ID	0-1 1.5'				269	<1.4	<0.9	21	67	
	D-7 1'				362	<1.0	<0.7	28	100	
	D-23 3'				618	<0.6	0.45±	36	123	
	G-27 1'				825	<0.5	0.44±	34	130	
	G-33 3'				549	<0.7	<0.4	40	102	
	E-129 3'				280	<1.3	<0.8	26	111	
	D-5 3'				920	<0.4	<0.3	44	115	
	A-80 1'				674	<0.6	<0.4	16	84	
77	E-129 1'				245	<1.5	<1.0	34	95	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS INC

SAMPLE ANALYSIS DATA SHEET

PAGE 8 OF 18

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						CO60	CS137	co int	cs int	bkgd co/cs
	A-80 25'	MARONELLI SOIL	STORED SAMPLES	8/12/86	510	<0.7	<0.5	41	74	
	D-27 2'				533	<0.7	<0.4	33	94	
	D-3 3'				446	<0.8	<0.5	31	95	
	D-18 2'				741	9.0±	4.6±	290	404	
	E-139 3'				260	<1.4	<0.9	28	81	
	B-36 1'				380	<1.0	<0.6	28	91	
	G-28 1'				580	<0.6	<0.4	31	112	
	A-30 3'				737	<0.5	0.69±	35	143	
	D-17 2'				1024	<0.4	0.48±	40	142	
	D-3 1'				507	<0.7	<0.5	40	76	
88	D-21 2'				603	<0.6	0.61±	43	131	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						CO60	CS137	co int	cs int	bkgd co/cs
	D-3 SURFACE	MARINELLI SOIL	STORED SAMPLES	8/12/86	476	9.5±	31.9±	191	1309	
	G-23 2'				1157	<0.3	<0.2	34	108	
	G-33 2'				642	<0.6	<0.4	50	107	
	G-28 2'				686	<0.5	<0.3	41	99	
	G-28 3'				771	<0.5	0.47±	37	130	
	A-93 3'				588	<0.6	0.71±	54	135	
	G-51 2'				985	<0.4	0.34±	44	128	
	D-1 3'				489	<0.8	<0.5	28	77	
	D-17 3'				697	<0.5	<0.3	34	104	
	D-19 2.5' (H2O)				524	<0.7	<0.5	38	95	
99	B-43 2'				105	<3.6	<2.3	23	69	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						CO60	CS137	co int	cs int	bkgd co/cs
	D-19 2.5' (H20)	MARINELLI SOIL	STORED SAMPLES	8/12/86	444	<0.8	<0.5	33	106	
	B-42 4"				112	<3.4	33.7±	45	434	
	O-2 1'				306	<1.0	<0.6	28	69	
	O-2 2.5'				369	<1.0	<0.6	19	83	
	O-1 2'				207	<1.8	<1.1	15	57	
	O-5 1'				629	<0.6	<0.4	26	73	
	O-5 2'				651	<0.6	<0.4	25	76	
	LOADING DOCK				162	53.7±	246.1±	364	3646	
	S. MUSEUM FOUND @ 1'				6065	<0.6	0.45±	48	125	
	S. MUSEUM FOUND @ 2'				662	<0.6	<0.4	42	102 ~~126~~	
110	S. MUS FOUND @3' BETWEEN SP5/SP6				567	<0.7	<0.4	49	107	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
TANK EXCAVATION	1500 GAL TANK SUPPORT @ 12' 1	MARINELLI SOIL	8/12/86	8/12/86	1100	<0.3	0.72±	40	169	
	" 2	↓	8/12/86	↓	1075	<0.3	0.38±	41	134	
	" 3	↓	8/12/86	↓	1177	<0.3	0.59±	45	160	
	A-122 S	MARINELLI SOIL	8/14/86	8/14/86	522	58.6±	ND	1166	986/206 ND ~~1031~~	*
	A-119 S	↓	↓	↓	437	19.8±	9.2±	354	458	*
	A-117 S	↓	↓	↓	529	20.9±	8.8±	443	516/204 ~~482~~	*
	A-114 S	↓	↓	↓	580	92.2±	ND	2013 ~~1989~~	ND ~~1624~~	
	A-123 S	↓	↓	↓	355	80.1±	ND	1086	ND ~~954~~	
	A-113 S	↓	↓	↓	704	17.2±	ND	482	ND ~~561~~	
120	A-111 S	↓	↓	↓	559	6.9±	6.8±	177	442	*

see EFF calibration data for 8/11/86

* CS PHOTOPEAK

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
	-FRONT- A-107 S	MARINELLI SOIL	8/14/86	8/14/86	A05	4.8±	3.6±	121	258	*
	-BACK- A-107 S				560	3.5±	3.2±	107	263	*
	CORNER C-53				56A	15.5±	13.2±	358	765	*
	A-1 S				T25	1.8±	1.3±	83	184	*
	A-3 S				733	< 0.5	< 0.3 ND	44	80	
	CORNER A-8 S				601	9.2±	ND	260	ND ~~318~~	
	A-9 S				T51	< 0.5	< ND	37	101	
	A-68 S				A76	147.2±	ND	2627	ND	
	A-70 S				0A1	164.1±	ND	2711	ND	
	A-72 S				620	29.5±	ND	711	ND	
131	A-74 S				0A6	65.6±	ND	1117	ND	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						C060	CS137	co int	cs int	bkgd co/cs
LOOSE AT TEAM DOWN DOCK	C23 to C25	MACNELL SOIL	8/4/86	8/5/86	439	0.9±	2.7±	47	211	*
	A-95				607	3.2±	2.8±	105	254	*
	A-99				643	3.5±	1.1±	117	167	*
	TRENCH A-12A				536	< 0.6	< ND	38	ND ~~403~~	
	A-100				516	3.7±	9.1±	112	568	*
	TRENCH A-125				516	< 0.6	< ND	36	ND ~~122~~	
	A-109				603	4.0±	3.7±	123	306	*
	A-64				627	15.1±	<0.4	364	119	*
	A-59				700	5.4±	ND	172	ND	
	A-51				629	1.4±	ND	65	ND	
142	A-47				653	3.1±	ND	107	ND	

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS, INC

SAMPLE ANALYSIS DATA SHEET

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CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
	A-77	MARINELLI SOIL	8/14/86	8/15/86	598	47.4 ±	ND	1061	ND	
	A-41				554	15.7 ±	16.4 ±	354	916	*
	A-36				604	<0.6	ND	42	ND	
	A-42				581	6.7 ±	8.9 ±	178	568	*
	CORNER A-40				616	6.5 ±	<0.4	181	103	*
	A-28				595	12.6 ±	6.9 ±	311	469	*
	A-26				573	4.4 ±	5.0 ±	126	361	*
	A-20				533	3.8 ±	4.6 ±	107	320	*
	A-11				629	1.0 ±	1.6 ±	57	189	*
	FOUNDATION C-53				612	19.8 ±	13.4 ±	482	829/439 829	*
153	FOUNDATION D-32				708	18.1 ±	7.3 ±	507	561/249	*

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
	FOUNDATION D-26	MACWELL SOIL	8/14/86	8/15/86	480	35.9±	17.6±	672	851/383	*
	E-100				592	33.0±	ND	756	ND	
	E-109 #1				516	10.7±	ND	260	ND	
	E-109 #2				717	13.6±	ND	374	ND	
	#1 FENCE E-129				555	25.6±	ND	558	ND	
	#2 FENCE E-129				617	2.5±	ND	91	ND	
	EDGE E-133				577	4.6±	ND	131	ND	
	TRENCH E-137				467	0.9±	ND	48	ND	
	TRENCH E-144				371	<0.9	ND	39	ND	
	FENCE E-151				673	<0.5	ND	26	ND	
164	AREA OUTSIDE GATE				545	17.7±	16.4±	370	677/504 677	*

see EFF calibration data for 8/11/86

CHEM-NUCLEAR SYSTEMS INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						C060	CS137	co int	cs int	bkgd co/cs
	E-124	MARINELLI SOIL	8/18/86	8/18/86	504	2.3±	ND	88	ND	
	E-125				687	<0.5	ND	39	ND	
	E-92				651	0.9±	ND	61	ND	
	E-122				626	<0.6	ND	39	ND	
	B-24				535	2.3±	ND	84	ND	
	B-34 #1				609	24.4±	ND	584	ND	
	B-34 #2				651	4.2±	ND	140	ND	
	B-41				732	0.81±	24.5±	61	1693	*
	C-12				667	2.0±	ND	89	ND	
	A-105				587	1.8±	ND	78	ND	
	B-5				511	4.8±	8.2±	129	472/290	*

see EFF calibration data for 8/18/86

CHEM-NUCLEAR SYSTEMS INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout -				
						C060	CS137	co int	cs int	bkgd co/cs
	B-15	MARINELLI SOIL	6/18/86	6/18/86	581	<0.5	0.6	38	128	*
	A-94		6/19/86	6/19/86	595	14.9±	15.2±	339	835	*
	A-96				509	3.2±	3.0±	100	235	*
	A-99				716	2.2±	2.6±	97	264	*
	A-100				573	21.4±	102.8±	492	5340	*
	A-99		6/20/86	6/20/86	582	11.0±	6.1±	274	418	*
	E-100				694	16.9±	ND	472	ND	
	E-101				707	20.3±	ND	568	ND	
	E-101				702	17.7±	ND	497	ND	
	E-111				550	1.8±	ND	74	ND	
	E-119				708	0.8±	ND	58	ND	

see EFF calibration data for 6/18/86

CHEM-NUCLEAR SYSTEMS INC

SAMPLE ANALYSIS DATA SHEET

CNSI/HAI fort mcClellan

TAG ID	SAMPLE IDENT	SAMPLE TYPE	SAMPLE DATE	ANALYSIS DATE	WT. gms.	RESULT OF GAMMA ISOTOPIC (pCi/gm) - see attached computer analysis printout - C060	CS137	co int	cs int	bkgd co/cs
	D2, D3, D4 DRW GUTTER	MARINELLI SOIL	8/21/86	8/21/86	809	8.6±	26.8±	295	2035	*
	VALVE PIT SAMPLE	MARINELLI SLUDGE	8/27/86	8/27/86	445.8	131 ± 0.5	42 ± 2.0	2258	1656	.34 / .16
SOD SEC SAMPLE CNT.	SOURCE STORAGE BLDG.	PETRI CONCRETE	8/29/86	8/29/86	14.9	ND	551 ± 31	ND	2786	0.17 / 0.42
SOD SEC SAMPLE CNT.	SOURCE STORAGE BLDG.	PETRI CONCRETE	8/29/86	8/29/86	15.3	16 ± 7.0	2868 ± 48	187	13964	
	A-100 AFTER SOIL REMOVAL	MARINELLI SOIL	8/29/86	8/29/86	796	31 ± 2.0	38 ± 1.5	943	2652	
OUTSIDE GATE PRIOR TO SOIL REMOVAL	OUTSIDE OF GATE	"	8/29/86	8/29/86	555	37 ± 2.7	41 ± 1.9	783	2014	
AFTER SOIL REMOVAL	OUTSIDE OF GATE	"	9/1/86	9/1/86	807	3.2 ± 0.7	2.0 ± 0.5	119	187	
	OUTSIDE OF GATE	"	9/1/86	9/1/86	609	4.5 ± 1.0	1.9 ± 0.9	125	182	
	OUTSIDE OF GATE	"	9/1/86	9/1/86	540	3.1 ± 0.9	1.2 ± 0.6	84	126	
	OUTSIDE OF GATE	"	9/1/86	9/1/86	706	5.9 ± 1.1	3.1 ± 1.2	178	238	
	E-109 AFTER SOIL REMOVAL	"	8/29/86	9/1/86	700	14.2 ± 0.5	ND	390	ND	

see EFF calibration data for 8/18/86

CHEM-NUCLEAR SYSTEMS INC

CHEM-NUCLEAR SYSTEMS, INC

MCA ENERGY/EFFICIENCY CALIBRATION
DATA SHEET

ISOTOPE AND PRINCIPAL ENERGY (MEV)	RADIOACTIVITY AND DATE OF CALIBRATION	CALCULATED ACTIVITY	AP-PAK COMPUTED ACTIVITY	AP-PAK COMPUTED EFFICIENCY
CD109 @ 0.088				
CO57 @ 0.122				
CE139 @ 0.166				
HG203 @ 0.279				
SN113 @ 0.392				
SR85 @ 0.514				
CS137 @ 0.662 @ CHAN 770	0.092 μCi @ 1/1/84	0.092 μCi @ 8/7/86	0.092 μCi	0.028
Y88 @ 0.898				
CO60 @ 1.173				
CO60 @ 1.332 @ CHAN 1467	0.112 μCi @ 1/1/84	0.079 μCi @ 8/7/86	0.079 μCi	0.010
Y88 @ 1.836				
CS137 @ 0.662	NA			
CO60 @ 1.173 1.332				
NA22 @ 1.275				
BA133 @ 0.356				
MN54 @ 0.835				

SOURCE STANDARD DECAY TIME: 2.6 YRS.

SOURCE IDENTIFICATION	HA005 <MARINELLI>	DATE PERFORMED	AUGUST 7, 1986
ECAL/EFF CALIBRATION DATE	AUGUST 7, 1986	PERFORMED BY	SE MILLER
-see attached computer printout-		MEMORY SEGMENT	1/2

HILBERT & ASSOCIATES, INC.

CHEM-NUCLEAR SYSTEMS, INC
RCP-800, REV. 01

MCA ENERGY/EFFICIENCY CALIBRATION
DATA SHEET

ISOTOPE AND PRINCIPAL ENERGY (MEV)	RADIOACTIVITY AND DATE OF CALIBRATION	CALCULATED ACTIVITY	AP-PAK COMPUTED ACTIVITY	AP-PAK COMPUTED EFFICIENCY
CD109 @ 0.088				
CO57 @ 0.122				
CE139 @ 0.166				
HG203 @ 0.279				
SN113 @ 0.392				
SR85 @ 0.514				
CS137 @ 0.662 CENTROID @ 709	0.098 uCi @ 1/1/84	0.092 uCi @ 8/11/86	0.092 uCi	0.026
Y88 @ 0.898				
CO60 @ 1.173				
CO60 @ 1.332 CENTROID @ 1529	0.112 uCi @ 1/1/84	0.079 uCi @ 8/11/86	0.079 uCi	0.010
Y88 @ 1.836				
CS137 @ 0.662				
CO60 @ 1.173 1.332				
NA22 @ 1.275				
BA133 @ 0.356				
MN54 @ 0.835				

SOURCE DECAY TIME = 26 YRS.

SOURCE IDENTIFICATION	HA005 <MARINELLI>	DATE PERFORMED	8/11/86
ECAL/EFF CALIBRATION DATE	8/11/86	PERFORMED BY	SE MILLER
-see attached computer printout-		MEMORY SEGMENT	1/2

HADDEN & ASSOCIATES, INC.

MCA ENERGY/EFFICIENCY CALIBRATION
DATA SHEET

ISOTOPE AND PRINCIPAL ENERGY (MEV)	RADIOACTIVITY AND DATE OF CALIBRATION	CALCULATED ACTIVITY	AP-PAK COMPUTED ACTIVITY	AP-PAK COMPUTED EFFICIENCY
CD109 @ 0.088				
CO57 @ 0.122				
CE139 @ 0.166				
HG203 @ 0.279				
SN113 @ 0.392				
SR85 @ 0.514				
CS137 @ 0.662 CENTROID @ 662	0.098 uCi @ 1/1/84	0.092 uCi	0.092 uCi	0.028
Y88 @ 0.898				
CO60 @ 1.173				
CO60 @ 1.332 CENTROID @ 1341	0.112 uCi @ 1/1/84	0.079 uCi	0.079 uCi	0.010
Y88 @ 1.836				
CS137 @ 0.662				
CO60 @ 1.173 1.332				
NA22 @ 1.275				
BA133 @ 0.356				
MN54 @ 0.835				

SOURCE DECAY TIME = 26 YR

SOURCE IDENTIFICATION	HA005 <MARINELLI>	DATE PERFORMED	6/16/86
ECAL/EFF CALIBRATION DATE	AUGUST 18, 1986	PERFORMED BY	SE MILLER
-see attached computer printout-		MEMORY SEGMENT	1/2

CHEM-NUCLEAR SYSTEMS INC

HILBERT & ASSOCIATES, INC.

RCP-800, REV. 01

MCA ENERGY/EFFICIENCY CALIBRATION
DATA SHEET

ISOTOPE AND PRINCIPAL ENERGY (MEV)	RADIOACTIVITY AND DATE OF CALIBRATION	CALCULATED ACTIVITY	AP-PAK COMPUTED ACTIVITY	AP-PAK COMPUTED EFFICIENCY
CD109 @ 0.088				
CO57 @ 0.122				
CE139 @ 0.166				
HG203 @ 0.279				
SN113 @ 0.392				
SR85 @ 0.514				
CS137 @ 0.662 CENTROID @ 800	0.098 uCi @ 1/1/84	0.092 uCi	0.092	0.027
Y88 @ 0.898				
CO60 @ 1.173				
CO60 @ 1.332 CENTROID @ 1567	0.112 uCi @ 1/1/84	0.079 uCi	0.079	0.0097
Y88 @ 1.836				
CS137 @ 0.662				
CO60 @ 1.173 1.332				
NA22 @ 1.275				
BA133 @ 0.356				
MN54 @ 0.835				

SOURCE DECAY TIME = 2.6 YRS

SOURCE IDENTIFICATION HA 005 (MARINELLI)	DATE PERFORMED 8-27-86
ECAL/EFF CALIBRATION DATE AUGUST 27, 1986	PERFORMED BY JM RIGGI
-see attached computer printout-	MEMORY SEGMENT 1/2

HILBERT & ASSOCIATES, INC.

MCA ENERGY/EFFICIENCY CALIBRATION DATA SHEET

ISOTOPE AND PRINCIPAL ENERGY (MEV)	RADIOACTIVITY AND DATE OF CALIBRATION	CALCULATED ACTIVITY	AP-PAK COMPUTED ACTIVITY	AP-PAK COMPUTED EFFICIENCY
CD109 @ 0.088				
CO57 @ 0.122				
CE139 @ 0.166				
HG203 @ 0.279				
SN113 @ 0.392				
SR85 @ 0.514				
CS137 @ 0.662 CENTROID @ 827	0.145 uCi @ 11/21/83	0.136 uCi @ 8-29-86	0.136 uCi	0.0197
Y88 @ 0.898				
CO60 @ 1.173				
CO60 @ 1.332 CENTROID @ 1415	0.151 uCi @ 11/21/83	0.105 uCi @ 8-29-86	0.104 uCi	0.023
Y88 @ 1.836				
CS137 @ 0.662				
CO60 @ 1.173 1.332				
NA22 @ 1.275				
BA133 @ 0.356				
MN54 @ 0.835				

SOURCE DECAY TIME = 2.75 yrs

SOURCE IDENTIFICATION HA 004 (PETRI)	DATE PERFORMED 8-29-86
ECAL/EFF CALIBRATION DATE 8-29-86	PERFORMED BY Dhi Ricci
-see attached computer printout-	MEMORY SEGMENT 2/2

CHEM-NUCLEAR SYSTEMS, INC

HILBERT & ASSOCIATES, INC.

RCP-800, REV. 01

MCA ENERGY/EFFICIENCY CALIBRATION
DATA SHEET

ISOTOPE AND PRINCIPAL ENERGY (MEV)	RADIOACTIVITY AND DATE OF CALIBRATION	CALCULATED ACTIVITY	AP-PAK COMPUTED ACTIVITY	AP-PAK COMPUTED EFFICIENCY
CD109 @ 0.088				
CO57 @ 0.122				
CE139 @ 0.166				
HG203 @ 0.279				
SN113 @ 0.392				
SR85 @ 0.514				
CS137 @ 0.662 CENTROID @ 820	0.098 uCi @ 1/1/84	@ 8-29-86 0.092 uCi	0.092 uCi	0.07
Y88 @ 0.898				
CO60 @ 1.173				
CO60 @ 1.332 CENTROID @ 1587	0.112 uCi @ 1/1/84	@ 8-29-86 0.079 uCi	0.079	0.010
Y88 @ 1.836				
CS137 @ 0.662				
CO60 @ 1.173 1.332				
NA22 @ 1.275				
BA133 @ 0.356				
MN54 @ 0.835				

SOURCE DECAY TIME = 2.6 yrs

SOURCE IDENTIFICATION	HA 005 (MARINELLI)	DATE PERFORMED	8-29-86
ECAL/EFF CALIBRATION DATE	8-29-86	PERFORMED BY	JM RILLI
-see attached computer printout-		MEMORY SEGMENT	1/2

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ENCLOSURE B

RADIOACTIVE WASTE INVENTORY FOR FORT MCCLELLAN, ALA.

ITEM #	PACKAGE TYPE	DESCRIPTION OF CONTENTS	WEIGHT	MAX. RADIATION CONTACT	LEVEL mR/hr 1m
1.	17H 55-Gallon Drum	25% Concrete/75% Soil	900	.1	.1
2.	17H 55-Gallon Drum	Soil From Outside Fence (Gate)	850	.1	.1
3.	17H 55-Gallon Drum	75% Concrete/25% Soil	650	1.0	0.1
4.	17H 55-Gallon Drum	Soil/HEPA Filter/Misc. Waste	600	7.0	0.2
5.	17H 55-Gallon Drum	Misc. Rad Waste/Trash	200	0.15	.1
6.	17H 55-Gallon Drum	Misc. Rad Waste/Trash	150	.1	.1
7.	17H 55-Gallon Drum	Misc. Rad Waste/Trash	150	0.1	.1
8.	17H 55-Gallon Drum	Misc. Rad Waste/Trash	200	.1	.1
9.	17H 55-Gallon Drum	Soil/HEPA Filter	500	0.35	0.05
10.	4' X 4' X 6' 96Ft^3 STC (Metal)	Soil/Contaminated Pipe	5300	4.5	0.15
11.	368 Ft^3 STC (Wood)	1500 Gal Tank/100 Gal Tank HEPA Ventilation System Components, Misc. Contaminated Wastes	5950	5.0	1.2
12.	17H 55-Gallon Drum	Soil From Outside Fence (Gate)	650	.1	.1
13.	17H 55-Gallon Drum	Soil From Outside Fence (Gate)	800	.1	.1
14.	17H 55-Gallon Drum	Soil From Outside Fence (Gate) & Misc. Waste	500	0.3	0.1
TOTALS 14 UNITS	554 Ft^3		17400		

CHEM-NUCLEAR SYSTEMS INC

HILBERT ASSOCIATES, INC. / CNSI

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID	LOCATION	SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
A-1	1-10	A-1	SURFACE	1.8	1.3
A-2	1-6				
A-3	1-1	A-3	SURFACE	<0.5	ND
A-4	1-2				
A-5	1-3				
A-6	1-4				
A-7	1-5				
A-8**	1-9	A-8	SURFACE	9.2	ND
		CEP #16	SURFACE	0.9	ND
		CEP #20	SRC WELL 3'	ND	ND
		CEP #21	SRC WELL 2'	ND	0.8
		CEP #A	SURFACE CRACK	19.4	4.07
A-9	1-7	A-9	SURFACE	<0.5	ND
A-10	1-8				
A-11	1-68	A-11	SURFACE	1.0	1.6
A-12	1-67				
A-13	1-66				
A-14	1-65				
A-15	1-64				
A-16	1-63				
A-17	1-62				
A-18	1-61				
A-19	1-60				
A-20	1-59	A-20	SURFACE	3.8	4.6
		CEP #25	SURFACE 1'	0.1	1.5
A-21	1-58				
A-22	1-57				
A-23	1-56				
A-24	1-55				
A-25	1-54				
A-26	1-53	A-26	SURFACE	4.4	5.0
A-27	1-52				
A-28**	1-51	A-28	SURFACE	12.6	6.9
A-29	1-50				
A-30	1-49	A-30	SURFACE 1'	<1.1	1.4
		A-30	2'	3.0	3.2
		A-30	3'	<0.5	0.7
A-31	1-48				
A-32	1-47				
A-33	1-46				
A-34	1-45				
A-35	1-44				
A-36	1-43	A-36	SURFACE	<0.6	ND
A-37	1-42				
A-38	1-41				
A-39	1-40				
A-40	1-39	A-40 CORNER	SURFACE	6.5	<0.4
A-41**	1-38	A-41	SURFACE	15.7	16.4
A-42	1-37	A-42	SURFACE	6.7	8.9
A-43	1-36				
A-44	1-35				
A-45	1-34				
A-46	1-33				
A-47	1-32	A-47	SURFACE	3.1	ND
A-48	1-31				

<<<<<<<<<<<<< ** INDICATES 15 pCi/gm OR GREATER - ALL PAGES >>>>>>>>>>>>>

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID	LOCATION	SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
A-49	1-30				
A-50	1-29				
A-51	1-28	A-51	SURFACE	1.4	ND
A-52	1-27				
A-53	1-26				
A-54	1-25				
A-55	1-24				
A-56	1-23				
A-57	1-22				
A-58	1-21				
A-59	1-20	A-59	SURFACE	5.4	ND
A-60	1-19				
A-61	1-18				
A-62	1-17	A-62	SURFACE 1'	<0.5	<0.4
		A-62	2'	<0.6	<0.4
A-63	1-16				
A-64**	1-15	A-64	SURFACE	15.1	<0.4
A-65	1-14				
A-66	1-13				
A-67	1-12				
A-68**	1-11	A-68	SURFACE	147.2	ND
A-69	1-10B	A-69	SURFACE 1'	6.9	2.3
A-70**	1-9A	A-70	SURFACE	164.1	ND
A-71	1-69				
A-72**	1-70	A-72	SURFACE	29.5	ND
A-73	1-71				
A-74**	1-72	A-74	SURFACE	65.6	ND
A-75	1-73				
A-76	1-74	A-76	3'	<0.6	<0.4
		CEP #29	2'	0.89	0.05
A-77**	1-75	A-77	SURFACE 1'	<0.5	<0.3
		A-77	2'	<0.7	<0.5
		A-77	3'	<0.5	<0.3
		A-77	SURFACE	47.4	ND
A-78	1-76				
A-79	1-77				
A-80	1-78	A-80	SURFACE 1'	<0.6	<0.4
		A-80	2.5'	<0.7	<0.5
A-81	1-79				
A-82	1-80				
A-83	1-81				
A-84	1-82				
A-85	1-83				
A-86	1-84				
A-87	1-85				
A-88	1-86				
A-89	1-87				
A-90	1-88				
A-91	1-89				
A-92	1-90	A-92	SURFACE 1'	<0.6	0.65
		A-92	3'	<0.7	<0.5
A-93	1-91	A-93	SURFACE 1'	1.4	1.0
		A-93	2'	0.8	1.3
		A-93	3'	<0.6	0.7
A-94**	1-92	A-94	SURFACE	14.9	15.2
		A-94	SURFACE 1'	2.0	1.9
		A-94	2'	0.8	1.1
		A-94	3'	1.6	1.5

HILBERT ASSOCIATES, INC. / CNSI

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID LOCATION		SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
A-95	1-93	A-95	SURFACE 1'	0.9	1.1
		A-95	2'	2.0	1.6
		A-95	3'	<0.6	<0.4
		A-95	SURFACE	3.2	2.8
A-96	1-94	A-96	SURFACE	3.2	3.0
A-97	1-95				
A-98	1-96				
A-99	1-97	A-99	SURFACE	11.0	6.1
A-100**	1-98	A-100	SURFACE 1'	13.3	62.4
		A-100	2'	13.1	59.4
		A-100	3'	6.6	26.8
		A-100	SURFACE	21.4	102.8
		A-100 ***		31.	38.
*** sample result after removal of 7 ft3 soil 8/86					
A-101	1-99	A-101	SURFACE 1'	2.9	4.1
		A-101	2'	1.6	0.9
		A-101	3'	<0.6	0.9
A-102	1-100	A-102	SURFACE 1'	<0.6	0.6
		A-102	2'	<0.7	0.6
		A-102	3'	<0.7	0.6
A-102A	1-102				
A-103A	1-103				
A-104	1-104				
A-105	1-105	A-105	SURFACE	1.8	ND
A-106	1-106				
A-107	1-107	A-107	SURFACE	4.8	3.6
		A-107	2'	0.8	1.6
		A-107	3'	1.6	1.2
A-108	1-108				
A-109	1-109	A-109	SURFACE	4.0	3.7
A-110	1-110				
A-111	1-111	A-111	SURFACE	6.9	6.8
A-112	1-112				
A-113**	1-113	A-113	SURFACE	17.2	ND
A-114**	1-114	A-114	SURFACE	92.2	ND
A-115	1-115				
A-116	1-116				
A-117**	1-117	A-117	SURFACE	20.9	8.8
A-118	1-118				
A-119**	1-119	A-119	SURFACE	19.8	9.2
A-120	1-120				
A-121	1-121				
A-122**	1-122	A-122	SURFACE	58.6	ND
A-123**	1-123	A-123	SURFACE	80.1	ND
A-124	1-124	A-124 TRENCH	SURFACE	<0.6	ND
A-125	1-125	A-125 TRENCH	SURFACE	<0.6	ND
B-1	2-16				
B-2	2-17				
B-3	2-18				
B-4	2-19				
B-5	2-20	B-5	SURFACE	4.8	8.2
B-6	2-21				
B-7	2-22				
B-8	2-23				
B-9	2-24				

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID	LOCATION	SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
B-10	2-25				
B-11	2-26				
B-12	2-27				
B-13	2-28				
B-14	2-29				
B-15	2-30	B-15	SURFACE	<0.5	0.6
B-16	2-31				
B-17	2-32				
B-18	2-33				
B-19	2-34				
B-20	2-35				
B-21	2-36				
B-22	2-37				
B-23	2-38				
B-24	NA	B-24	SURFACE	2.3	ND
B-25	M-11				
B-26	M-13				
B-27	M-14				
B-28	M-15				
B-29	M-16				
B-30	M-17				
B-31	M-19				
B-32	M-10				
B-33	M-12				
B-34**	M-18	B-34	SURFACE	24.4	ND
B-35	2-1				
B-36	2-2	B-36	SURFACE 1'	<1.0	<0.6
		B-36	2'	<0.6	<0.4
		B-36	3'	<0.5	0.7
		CEP #18	SURFACE 1'	ND	ND
B-37	2-3				
B-38	2-4	B-38	SURFACE 1'	0.16	0.8
		B-38	2'	<0.5	<0.4
		B-38	3'	0.7	0.6
B-39	2-5				
B-40	2-6				
B-41**	2-7	B-41	SURFACE	0.8	24.5
		CEP #3(SP-1)	SURFACE 3"	1.8	116.
		CEP #9(SP-1)	EXP JOINT 4"	ND	136.
B-42**	2-8				
		B-42	4"	<3.4	33.7
B-43	2-9				
		B-43	2'	<3.6	<2.3
B-44	2-10				
B-45	2-11				
B-46	2-12				
B-47	2-13				
B-48	2-14				
B-49	2-15				
C-1	M-3				
C-2	M-7				
C-3	M-2				
C-4	M-6				

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID	LOCATION	SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
C-5	M-1				
C-6	M-5				
C-7	M-22				
C-8	M-25				
C-9	M-28				
C-10	M-31				
C-11	M-21				
C-12	M-24	C-12	SURFACE	2.0	ND
C-13	M-27				
C-14	M-30				
C-15	W-64				
C-16	M-20				
C-17	M-23				
C-18	M-26				
C-19	M-29				
C-20	W-63				
C-21	3-1				
C-22	3-2				
C-23**	3-3	C-23	SEAM AT LOAD DOCK	0.9	2.7
		C-23	2'	<0.3	<0.2
		C-23	3'	<0.6	0.5
		CEP #26	LOAD DOCK	32.8	162.
		CEP #D	SURFACE SOIL	15.9	72.3
		CEP #E	8" DEEP	71.4	364.
C-24	3-4				
C-25	3-5				
C-26	3-6				
C-27	3-10	C-27	SURFACE 1'	<0.5	<0.3
C-28	3-11	C-28	SURFACE 1'	<0.6	<0.4
		C-28	2'	<0.5	<0.3
		C-28	3'	<0.5	0.5
		CEP #10	3 FEET	ND	ND
		CEP #13	SURFACE 1'	ND	ND
C-29	3-12				
C-30	3-13				
C-31	3-14				
C-32	3-15				
		C-32	2'	<0.6	<0.4
		C-32	3'	<0.6	<0.4
C-33	3-7	C-33	SURFACE 1'	<0.5	0.7
		C-33	2'	<0.6	<0.4
		C-33	3'	<0.7	<0.4
C-34	3-8				
C-35	3-9				
C-36	3-17				
C-37	3-18				
C-38	3-19				
C-39	3-20				
C-40	3-21				
C-41	3-15				
C-42	3-16				
C-43	3-26				
C-44	3-27				
C-45	3-22				
C-46	3-23				
C-47	3-24				
C-48	3-25				
C-49	3-28				

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID	LOCATION	SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
C-50	3-29	C-50	SURFACE 1'	<0.6	<0.4
C-51	3-30	C-51	SURFACE 1'	0.6	<0.4
		C-51	2'	<0.4	0.34
C-52	3-31				
C-53**	3-32	C-53 CORNER	SURFACE	15.5	13.2
		C-53 FOUNDATION	SURFACE	19.8	13.4
D-1	5-1	D-1	SURFACE 1'	<1.2	<0.8
		D-1	2'	<0.7	<0.5
		D-1	3'	<0.8	<0.5
		CEP #19	SURFACE 1'	ND	ND
D-2	5-2				
D-3**	5-3	D-3	SURFACE 1'	<0.7	<0.5
		D-3	2'	<0.7	<0.4
		D-3	3'	<0.8	<0.5
		D-3	SURFACE GUTTER	9.5	31.9
		CEP #11	3 FEET	ND	ND
		CEP #15	SURFACE 1'	ND	ND
D-4**	5-4	D-4	SURFACE GUTTER	8.6	26.8
D-5	5-5	D-5	SURFACE 1'	<0.8	<0.5
		D-5	2'	<0.9	<0.6
		D-5	3'	<0.4	<0.3
		CEP #14	SURFACE 1'	ND	ND
D-6	5-6				
D-7	5-7				
		D-7	2'	<0.7	<0.5
		D-7	3'	<0.5	0.3
D-8	5-8				
D-9	NA				
D-10	NA				
D-11	NA				
D-12	NA				
D-13	NA				
D-14	5-9				
D-15	5-10				
		D-15	2'	0.52	0.54
		D-15	3'	<0.3	0.5
D-16	5-11				
D-17	5-12	D-17	SURFACE 1'	<1.0	<0.7
		D-17	2'	<0.4	0.5
		D-17	3'	<0.5	<0.3
		CEP #5	SURFACE 1'	1.2	0.8
D-18	5-16				
		D-18	2'	9.0	4.6
		D-18	3'	<0.6	0.6
D-19	5-13				
		D-19	2.5'	<0.7	<0.5
		CEP #27	SURFACE 1'	0.40	0.68
D-20	5-14				
D-21	5-15	D-21	SURFACE 1'	<1.1	0.7
		D-21	2'	<0.6	0.6
		D-21	3'	<0.7	<0.4
		CEP #12	SURFACE 1'	2.5	1.2
		CEP #17	3 FEET	ND	ND

HILBERT ASSOCIATES, INC. / CNSI

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID	LOCATION	SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
D-22	5-17				
D-23	5-18	D-23	SURFACE 1'	<0.4	<0.3
		D-23	2'	<0.6	<0.4
		D-23	3'	<0.6	0.45
D-24	5-19				
D-25**	5-20	D-25	SURFACE 1'	<0.6	<0.4
		D-25	2'	<0.5	<0.3
		D-25	3'	<0.3	0.3
D-26**	5-21	D-26 FOUNDATION		35.9	17.6
		D-26	2'	0.95	1.9
		CEP #28	SURFACE 1'	0.25	0.93
D-27	5-22	D-27	SURFACE 1'	0.6	0.9
		D-27	2'	<0.7	<0.4
D-28	5-23				
D-29	5-24				
D-30	5-25				
D-31	5-26				
D-32**	5-27	D-32 FOUNDATION		18.1	7.3

E-1	E-1
E-2	E-2
E-3	E-3
E-4	E-4
E-5	E-5
E-6	E-6
E-7	E-7
E-8	E-8
E-9	E-9
E-10	E-10
E-11	E-11
E-12	E-12
E-13	E-13
E-14	E-14
E-15	E-15
E-16	E-16
E-17	E-17
E-18	E-18
E-19	E-19
E-20	E-20
E-21	E-21
E-22	E-22
E-23	E-23
E-24	E-24
E-25	E-25
E-26	E-26
E-27	E-27
E-28	E-28
E-29	E-29
E-30	E-30
E-31	E-31
E-32	E-32
E-33	E-33
E-34	E-34
E-35	E-35
E-36	E-36
E-37	E-37
E-38	E-38

HILBERT ASSOCIATES, INC. / CNSI

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID LOCATION		SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
E-40	E-40				
E-41	E-41				
E-42	E-42				
E-43	E-43				
E-44	E-44				
E-45	E-45				
E-46	E-46				
E-47	E-47				
E-48	E-48				
E-49	E-49				
E-50	E-50				
E-51	E-51				
E-52	E-52				
E-53	E-53				
E-54	E-54				
E-55	E-55				
E-56	E-56				
E-57	E-57				
E-58	E-58				
E-59	E-59				
E-60	E-60				
E-61	E-61				
E-62	E-62				
E-63	W-18				
E-64	W-27				
E-65	W-36				
E-66	W-45				
E-67	W-53				
E-68	W-61				
E-69	W-10				
E-70	W-17				
E-71	W-26				
E-72	W-35				
E-73	W-44				
E-74	W-25				
E-75	W-34				
E-76	W-43				
E-77	W-52				
E-78	W-60				
E-79	W-16				
E-80	W-24				
E-81	W-33				
E-82	W-42				
E-83	W-51				
E-84	W-59				
E-85	W-9				
E-86	W-15				
E-87	W-23				
E-88	W-32				
E-89	W-41				
E-90	W-50				
E-91	W-58				
E-92	W-4	E-92	SURFACE	0.9	ND
E-93	W-8				
E-94	W-14				
E-95	W-22				
E-96	W-31				
E-97	W-40				

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID LOCATION	SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
E-98 W-49				
E-99 W-57				
E-100**M-9	E-100	SURFACE	33.0	ND
	E-100	SURFACE	16.9	ND
E-101**W-3	E-101	SURFACE	20.3	ND
	E-101	SURFACE	17.7	ND
E-102 W-7				
E-103 W-13				
E-104 W-21				
E-105 W-30				
E-106 W-39				
E-107 W-48				
E-108 W-56				
E-109**M-4	E-109	SURFACE	10.7	ND
	E-109	SURFACE	13.6	ND
	E-109 ***		14.2	ND
***	sample result after removal of 4 ft3 soil 8/86			
E-110 M-8				
E-111 W-2	E-111	SURFACE	1.8	ND
E-112 W-6				
E-113 W-12				
E-114 W-20				
E-115 W-29				
E-116 W-38				
E-117 W-47				
E-118 W-55				
E-119 W-1	E-119	SURFACE	0.8	ND
E-120 W-5				
E-121 W-11				
E-122 W-19	E-122	SURFACE	<0.6	ND
E-123 W-28				
E-124 W-37	E-124	SURFACE	2.3	ND
E-125 W-46	E-125	SURFACE	<0.5	ND
E-126 W-54				
E-127 W-72				
E-128 W-77				
E-129**W-67	E-129	SURFACE 1'	<1.5	<1.0
	E-129	2'	1.3	0.6
	E-129	3'	<1.3	<0.8
	CEP #4	SURFACE	0.8	0.5
	CEP #24	3 FEET	0.4	0.3
	E-129 SURFACE ALONG FENCE		25.6	ND
E-130**W-71				
	CEP #1	MANWAY SS	ND	1.0
	CEP #2	MANWAY SS	177.	1.6
	CEP #7	MANWAY SS	191.	1.1
	CEP #30	SS PIPE CONTROL	0.48	0.83
	CEP #31	SS PIPE 3180	212.	0.47
	CEP #32	SS PIPE EXIT	108.	1.09
E-131 W-76				
E-132 W-82				
E-133 W-62	E-133	SURFACE	4.6	ND
E-134 W-66				
E-135 W-70				
E-136 W-75				
E-137 W-81	E-137 TRENCH	SURFACE	0.9	ND
E-138 W-86				

SOIL RADIOACTIVITY RESULTS FOR FORT McCLELLAN, ALA

GRID LOCATION		SAMPLE IDENT	SAMPLE DEPTH	Co60(pCi/gm)	Cs137(pCi/gm)
E-139	W-65	E-139	SURFACE 1'	<1.7	<1.0
		E-139	2'	<0.5	0.9
		E-139	3'	<1.4	<0.9
		CEP #6	3 FEET	ND	ND
		CEP #8	SURFACE	ND	ND
E-140	W-69				
E-141	W-74				
E-142	W-80				
E-143	W-85				
E-144	W-88	E-144	TRENCH SURFACE	<0.9	ND
E-145	W-68				
E-146	W-73				
E-147	W-79				
E-148	W-84				
E-149	W-87				
E-150	W-89				
E-151	W-78	E-151	ALONG FENCE	<0.5	ND
E-152	W-83				

********** CONCRETE SAMPLES & SAMPLES ADJACENT TO GRID **********

ROAD AT GATE	CEP #22(0-5)	SURFACE	ND	ND
ROAD AT GATE	CEP #23(0-5)	SURFACE	ND	ND
UNDER PAVEMT	0-5	3'	<0.8	<0.5
SS IN ROAD	CEP #33		ND	0.11
B 3182 CONC	CEP #34	SURFACE	15.9	238.
B 3180 CONC	CEP #35	SURFACE	ND	270.
B 3180 VAULT ENTRY	CEP #B	SURFACE	60.9	2580.
B 3180 VAULT FLOOR	CEP #C	SURFACE	44.5	6600.
B 3192 FLOOR DRAIN	CEP #F	SURFACE	213.	16.3
AREA OUTSIDE GATE	CEP #G	SURFACE	30.7	16.3
AREA OUTSIDE GATE	CEP #H	SURFACE 8"	13.2	9.1
AREA OUTSIDE GATE	8/86	SURFACE	17.7	16.4
0-1		1.5'	<1.4	<0.9
	8/86	SURFACE	37.	41.
S MUS FOUNDATION	SP3/4	1'	<0.6	0.45
		2'	<0.6	<0.4
		3'	<0.7	<0.4
EXTENDED AREA OUTSIDE GATE ***			4.0	2.0

*** indicates avg of 4 soil samples after removal of 30 ft3 soil 8/86

VALVE PIT SLUDGE SAMPLE 8/86		131.	42.
SOURCE STORAGE BLDG FLOOR after concrete scabbling to 1/2 " depth			
	CONCRETE 1	ND	551.
	CONCRETE 2	16.	2868.

CONTAMINATION RADIATION SURVEY REPORT

CNSI

ACTIVITY LOCATION BLDG. 3192

SURVEYOR H. Fuller

☒ NO ACTION REQ'D ☐ CIRCLE READINGS, DECONTAMINATE IMMEDIATELY & CONTACT SUPERVISOR FOR RESURVEY

PERMISSIBLE LEVELS
☐ < 220 dpm 100 cm² ALPHA
☐ < 2200 dpm 100 cm² BETA GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ [illegible] dpm 100 cm² ALPHA
☐ [illegible] dpm 100 cm² BETA GAMMA

☐ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	BETA GAMMA	RADIATION BETA GAMMA
SOURCE I.D.			HA602
SOURCE STRENGTH	dpm	dpm	mR/h
INSTRUMENT RESPONSE	dpm	dpm	4.0 mR/h
	SAT ☐ UNSAT ☐	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐

BETA GAMMA BACKGROUND dpm mR/h

REASON FOR SURVEY ☐ PROCEDURE NO. ☒ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV. TO dpm/PROBE	dpm/100 cm²	BETA GAMMA EQUIV. TO dpm/PROBE	dpm/100 cm²	mR/h ☐ BETA GAMMA ☐ NEUTRON ☐ MICRO-R/h ☒	ITEM OR LOCATION
1						SEE MAP
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

DATE 9-2-86 TIME START 0730 TIME COMP. 0850 PAGE 1 OF 2

☐ DAILY ☐ WEEKLY ☐ MONTHLY ☐ QUARTERLY ☐ CONTAMINATION AND ☐ DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

GENERAL AREA DOSE RATE SURVEY, SEE MAP, ALL READINGS IN MICRO-R PER HR.

CONTAMINATION SURVEY / RADIATION SURVEY	INSTRUMENT TYPE TAG NO. / INSTRUMENT TYPE TAG NO.	ALPHA / NEUTRON	BETA GAMMA / BETA GAMMA (#22871) LUD MODEL 14

INDEPENDENT REVIEW DATE

SWIPE PROBE NO.	ALPHA EQUIV. TO dpm/PROBE	dpm/100 cm²	BETA GAMMA EQUIV. TO dpm/PROBE	dpm/100 cm²	mR/h ☐ BETA GAMMA ☐ NEUTRON ☐ MICRO-R/h ☐	ITEM OR LOCATION
18						SEE MAP
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

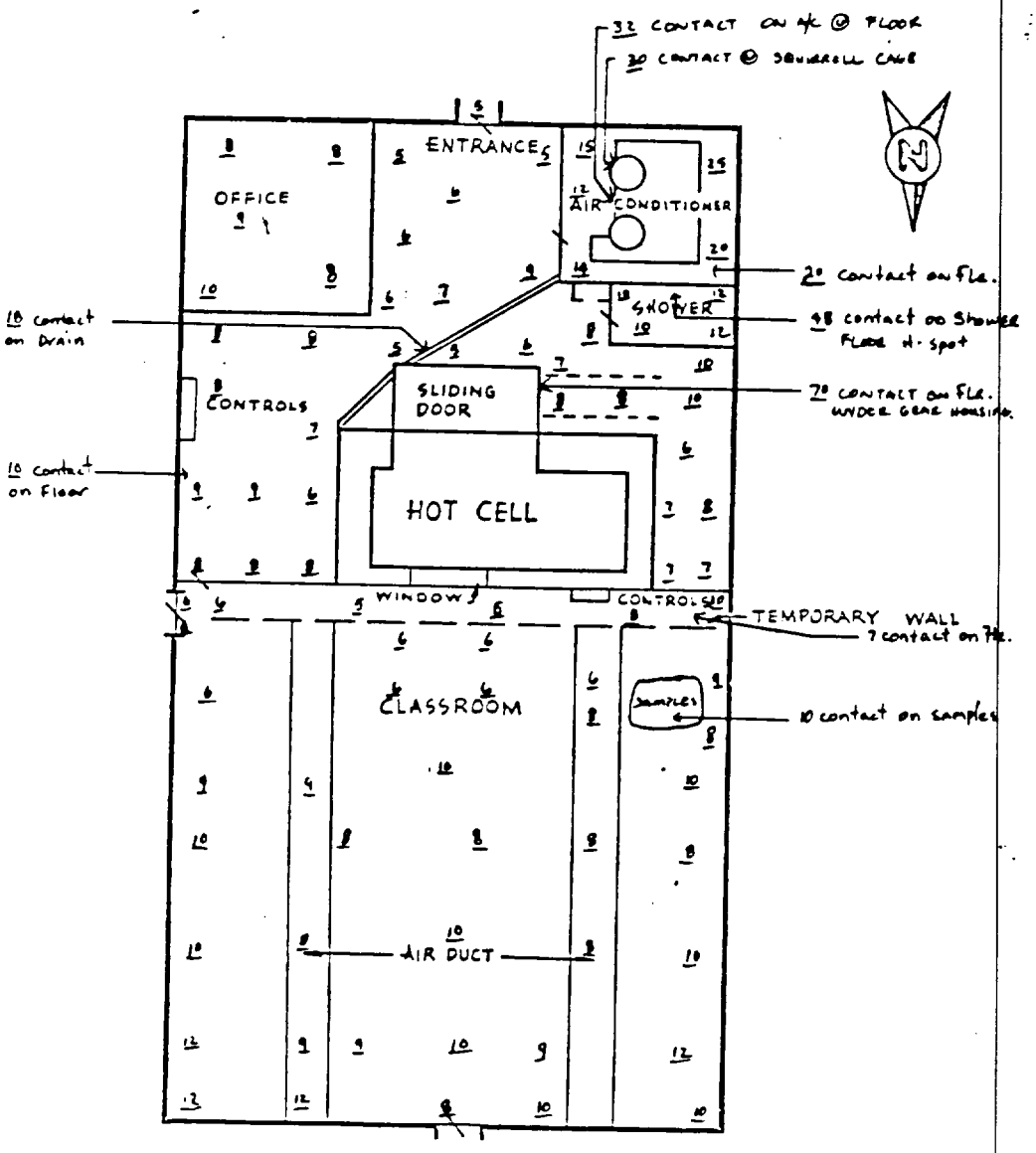
THE KNOWING & WILLFUL RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES.

RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC

ENCLOSURE D1
PAGE 1 OF 2

CHEM-NUCLEAR SYSTEMS INC



GENERAL AREA SURVEY
9-2-86 H. Fuller

PAGE 2 OF 2

CONTAMINATION RADIATION SURVEY REPORT

ACTIVITY LOCATION: Hilbert and Assoc.

CONTACT: H. Fuller

PHONE:

DATE: 8-28-86 TIME START: 1600 TIME FINISH: 1800 PAGE 1 OF 3

DAILY / WEEKLY / MONTHLY / OTHER — CONTAMINATION AND RADIATION SURVEY

☒ NO ACTION REQ'D ☐ CIRCLES READINGS "DECONTAMINATE IMMEDIATELY & CONTACT SURVEY OFFICER FOR RECURVEY"

PERMISSIBLE LEVELS
- ☐ < 220 dpm 100 cm² ALPHA
- ☐ < 220 dpm 100 cm² BETA GAMMA
- ☐ RESURVEY

CSCA AREA CONTROL LEVELS
- ☐ 220 dpm 100 cm² ALPHA
- ☐ 220 dpm 100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

COMMENTS: GAS ON FLOOR ALL < 1000 DPM/100CM² TO MASLON OFFICE WAS NOT PART OF CSCA BUT IS INCLUDED IN SURVEY.

SOURCE CHECK DATA

	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA GAMMA	RADIATION BETA GAMMA
SOURCE ID		843-85 Tc99	
SOURCE STRENGTH	dpm	13,100 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	16,000 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND: 760 dpm

CONTAMINATION SURVEY INSTRUMENT: ALNA 2377

RADIATION SURVEY INSTRUMENT: NE-RIM

INDEPENDENT RADIATION REVIEW: DATE

REASON FOR SURVEY
- ☐ PROCEDURE NO.
- ☒ SPECIAL
- ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV. TO dpm/probe	ALPHA EQUIV. TO dpm/100 cm²	BETA GAMMA EQUIV. TO dpm/probe	BETA GAMMA EQUIV. TO dpm/100 cm²	dpm/hr ☐ BETA GAMMA ☐ NEUTRON ☐ mR/hr ☐	ITEM OR LOCATION
1				<1000		FLOOR SEE MAP
2				<1000		"
3				<1000		"
4				<1000		"
5				<1000		"
6				<1000		"
7				<1000		"
8				<1000		"
9				<1000		"
10				<1000		"
11				<1000		"
12				<1000		"
13				<1000		"
14				<1000		"
15				<1000		"
16				<1000		"
17				<1000		DOOR TROUGH
18				<1000		"
19				<1000		"
20				<1000		FLOOR, SEE MAP
21				<1000		"
22				<1000		"
23				<1000		"
24				<1000		"
25				<1000		"
26				<1000		"
27				<1000		"
28				<1000		"
29				<1000		"
30				<1000		"
31				<1000		"
32				<1000		"
33				<1000		"
34				<1000		"
35				<1000		"
36				<1000		"
37				<1000		"
38				<1000		"
39				<1000		"
40				<1000		"

RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC

ENCLOSURE D.2
PAGE 1 OF 3

CONTAMINATION RADIATION SURVEY REPORT

ACTIVITY LOCATION: H & A

PROJECT

PHONE

DATE: 8-28-86

TIME START

TIME FINISH

PAGE 2 OF 3

☐ NO ACTION REQ'D ☐ CIRCLED READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS
☐ < 220 dpm 100 cm ALPHA
☐ < 2200 dpm 100 cm BETA GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm 100 cm ALPHA
☐ 2200 dpm 100 cm BETA GAMMA

☐ OTHER (SEE COMMENTS)

☐ ALPHA ☐ BETA GAMMA ☐ CONTAMINATION AND ☐ RADIATION SURVEY

COMMENTS: CONTINUATION OF CSCA RELEASE SURVEY

SOURCE CHECK DATA	CONTAMINATION SURVEYS		RADIATION
	ALPHA	BETA GAMMA	BETA GAMMA
SOURCE I.D.			
SOURCE STRENGTH	dpm	dpm	mR/hr
INSTRUMENT RESPONSE	dpm	dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☐ UNSAT ☐	SAT ☐ UNSAT ☐
BETA GAMMA BACKGROUND	dpm		mR/hr

REASON FOR SURVEY ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

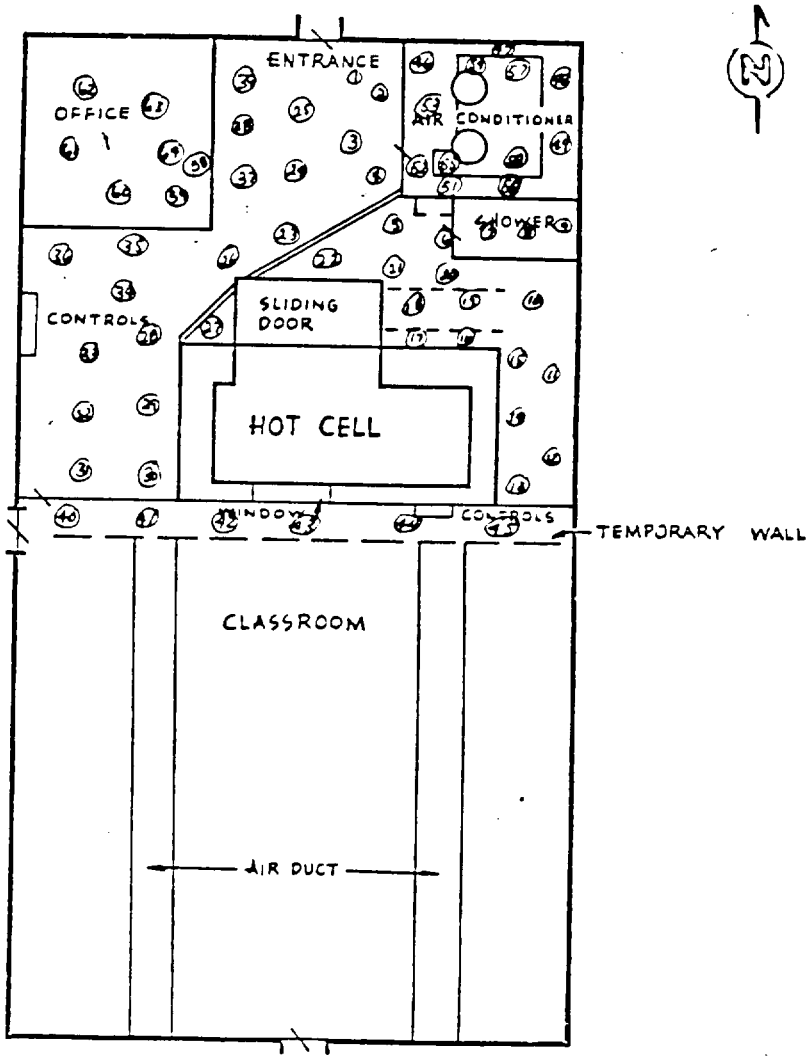
SWIPE PROBE NO.	ALPHA EQUIV. TM* dpm/probe	ALPHA EQUIV. TM* dpm/100 cm²	BETA GAMMA EQUIV. CS* dpm/probe	BETA GAMMA EQUIV. CS* dpm/100 cm²	mrem/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MR/HR/hr ☐	ITEM OR LOCATION
41				<1000		FLOOR SEE MAP
42				<1000		"
43				<1000		"
44				<1000		"
45				<1000		"
46				<1000		"
47				<1000		"
48				<1000		"
49				<1000		"
50				<1000		"
51				<1000		A-C unit-TOP
52				<1000		FLOOR SEE MAP
53				<1000		"
54				<1000		"
55				<1000		A-C UNIT - TOP
56				<1000		"
57				<1000		FLOOR SEE MAP
				<1000		A-C UNIT TOP

CONTAMINATION SURVEY / RADIATION SURVEY	INSTRUMENT TYPE & S/N	ALPHA DETECTOR	BETA GAMMA DETECTOR
INDEPENDENT RADIOLOGICAL REVIEW		DATE	

SWIPE PROBE NO.	ALPHA EQUIV. TM* dpm/probe	ALPHA EQUIV. TM* dpm/100 cm²	BETA GAMMA EQUIV. CS* dpm/probe	BETA GAMMA EQUIV. CS* dpm/100 cm²	mrem/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MR/HR/hr ☐	ITEM OR LOCATION
58				<1000		FLOOR SEE MAP
59				<1000		"
60				<1000		"
61				<1000		"
62				<1000		"
63				<1000		"
64				<1000		"
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						

RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC



PAGE 3 of 3
CSCA RELEASE 8-28-86

CONTAMINATION RADIATION SURVEY REPORT

ACTIVITY LOCATION: HOT CELL

TO: HILBERT & ASSOCIATES

Jim Riggs

PHONE

DATE: 8-25-86

TIME START

TIME COMPL.

PAGE 1 OF 8

☐ NO ACTION REQ'D ☐ CIRCLED READINGS REQ'D ELIMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

COMMENTS: FINAL SURVEY AFTER WIPEDOWN OF CELL

PERMISSIBLE LEVELS
- ☐ < 220 dpm 100 cm² ALPHA
- ☐ < 2200 dpm 100 cm² BETA GAMMA
- ☐ RESURVEY

CSLA AREA CONTROL LEVELS
- ☐ 220 dpm 100 cm² ALPHA
- ☐ 2200 dpm 100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA GAMMA	RADIATION BETA GAMMA
SOURCE I.D.		HA 010	
SOURCE STRENGTH	dpm	13,100 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	130 CPM	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND dpm mR/hr

CONTAMINATION SURVEY	INSTRUMENT TYPE/SER. NO.	ALPHA	BETA GAMMA
RADIATION SURVEY	INSTRUMENT TYPE/SER. NO.	NEUTRON	RM-14 / 4044

INDEPENDENT RADIOLOGICAL REVIEW DATE

REASON FOR SURVEY ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV. Th/U dpm/PROBE	ALPHA EQUIV. Th/U dpm/100 cm²	BETA GAMMA EQUIV. Cs dpm/PROBE	BETA GAMMA EQUIV. Cs dpm/100 cm²	mrem/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MICRO R/hr ☐	ITEM OR LOCATION
1			<1000			LEAD WINDOW
2			<1000			LIGHT FIXTURE (Na I)
3			1000			LEFT MANIPULATOR
4			<1000			" "
5			1000			RIGHT MANIPULATOR
6			<1000			" "
7			<1000			BALLAST
8			<1000			VENT. DUCT
9			<1000			LIGHT FIXTURE (Na I)
10			<1000			RAIL
11			<1000			RAIL
12			<1000			RAIL
13			<1000			RAIL
14			<1000			RAIL
15			<1000			RAIL
16			<1000			RAIL
17			1000			LIGHT FIXTURE
18			<1000			CRANE FRAME
19			2000			" "
20			<1000			" "
21			<1000			RAIL
22			1000			FRAME
23			<1000			RAIL
24			2000			FRAME
25			<1000			"
26			<1000			"
27			1000			MOTOR
28			<1000			CELL HOUSING
29			<1000			BACK WALL
30			<1000			BACK WALL
31			<1000			LEFT WALL (EAST)
32			<1000			RIGHT WALL (WEST)
33			<1000			FRONT WALL
34			<1000			PVC OVER VENT. DUCT
35			<1000			LIGHT FIXTURE
36			<1000			TOP OF VENT. DUCT
37			<1000			CRANE FRAME
38			<1000			" "
39			<1000			" "
40			<1000			RAIL

FALSIFICATION OF THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC

ENCLOSURE D.3

PAGE 1 OF 8

CONTAMINATION RADIATION SURVEY REPORT

ACTIVITY LOCATION Horcau

TO: HILBERT & ASSOCIATES

DATE 8-25-86

PAGE 2 OF 8

☐ NO ACTION REQD ☐ EXPOSED RESULTS - DECONTAMINATE IMMEDIATELY & CONTACT SUPERVISOR FOR RESURVEY

DAILY ☐ WEEKLY ☐ MONTHLY ☐ QUARTERLY ☐ CONTAMINATION AND RADIATION SURVEY

FINAL SURVEY AFTER WIPEDOWN OF CELL

PERMISSIBLE LEVELS
- ☐ < 22 dpm 100 cm² ALPHA
- ☐ < 2200 dpm 100 cm² BETA GAMMA
- ☐ RESURVEY

BETA AREA CONTROL LEVELS
- ☐ 22 dpm 100 cm² ALPHA
- ☐ 2200 dpm 100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA

	CONTAMINATION SURVEYS		RADIATION
	ALPHA	BETA GAMMA	BETA GAMMA
SOURCE ID			
SOURCE STRENGTH	dpm	13100 dpm	mR/h
INSTRUMENT RESPONSE	dpm	1300 cpm	mR/h
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND

REASON FOR SURVEY ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV TO: dpm/PROBE	ALPHA EQUIV TO: dpm/100 cm²	BETA GAMMA EQUIV TO: dpm/PROBE	BETA GAMMA EQUIV TO: dpm/100 cm²	☐ ALPHA ☐ BETA GAMMA ☐ NEUTRON ☐ MOD. RAD.	ITEM OR LOCATION
41			<1000			RAIL
42			<1000			RAIL
43			1000			MOTOR
44			<1000			CABLE HOUSING
45			1000			" "
46			<1000			" "
47			2000			" "
48			2000			CABLE
49			<1000			BLOCK LEDGE
50			1000			BLOCK LEDGE
51			<1000			TABLE TOP
52			1000			FLOOR UNDER TABLE
53			<1000			FLOOR - CENTER
54			<1000			FLOOR CENTER
55			<1000			FLOOR - SOURCE WELLS
56			<1000			FLOOR - SOURCE WELLS
57			<1000			ON SOURCE WELL

SWIPE PROBE NO.	ALPHA EQUIV TO: dpm/PROBE	ALPHA EQUIV TO: dpm/100 cm²	BETA GAMMA EQUIV TO: dpm/PROBE	BETA GAMMA EQUIV TO: dpm/100 cm²	☐ ALPHA ☐ BETA GAMMA ☐ NEUTRON ☐ MOD. RAD.	ITEM OR LOCATION
58			<1000			ON SOURCE WELL
59			<1000			FLOOR
60			2000			INSIDE CELL HOUSING
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						

* THE PROVISIONS OF THE FEDERAL CRIMINAL CODE PROVIDE FOR FINES OR IMPRISONMENT FOR FALSE OR FRAUDULENT STATEMENTS OR REPRESENTATIONS. VIOLATIONS MAY BE PUNISHABLE BY A FELONY UNDER FEDERAL STATUTES.

RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS INC

CONTAMINATION RADIATION SURVEY REPORT

TO: Hulett & Associates

DATE: 8-28-86 | TIME START: | TIME FIN: | PAGE 3 OF 8

ACTIVITY LOCATION: Hot Cell | SURVEYOR: Mike Rizzi | PHONE:

☐ NO ACTION REQ'D ☐ CIRCLED READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 2200 dpm/100 cm² BETA GAMMA
☐ RESURVEY

RA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 2200 dpm/100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

DAILY / WEEKLY / MONTHLY / QUARTERLY ☐ CONTAMINATION AND DAILY / WEEKLY / MONTHLY ☐ RADIATION SURVEY

CONTINUATION OF SURVEY DONE 8-25-86

SOURCE CHECK DATA	CONTAMINATION SURVEYS				RADIATION	
	ALPHA		BETA GAMMA		BETA GAMMA	
SOURCE ID						
SOURCE STRENGTH	dpm		dpm		mR/hr	
INSTRUMENT RESPONSE	dpm		dpm		mR/hr	
	SAT ☐	UNSAT ☐	SAT ☐	UNSAT ☐	SAT ☐	UNSAT ☐
BETA GAMMA BACKGROUND	dpm				mR/hr	

CONTAMINATION SURVEY	INSTRUMENT SERIAL NO.	ALPHA	BETA GAMMA
RADIATION SURVEY	INSTRUMENT SERIAL NO.	NEUTRON	RM/14 / 4041
			M-19 / 32871

INDEPENDENT RADION REVIEW _____ DATE _____

PEASON FOR SURVEY ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

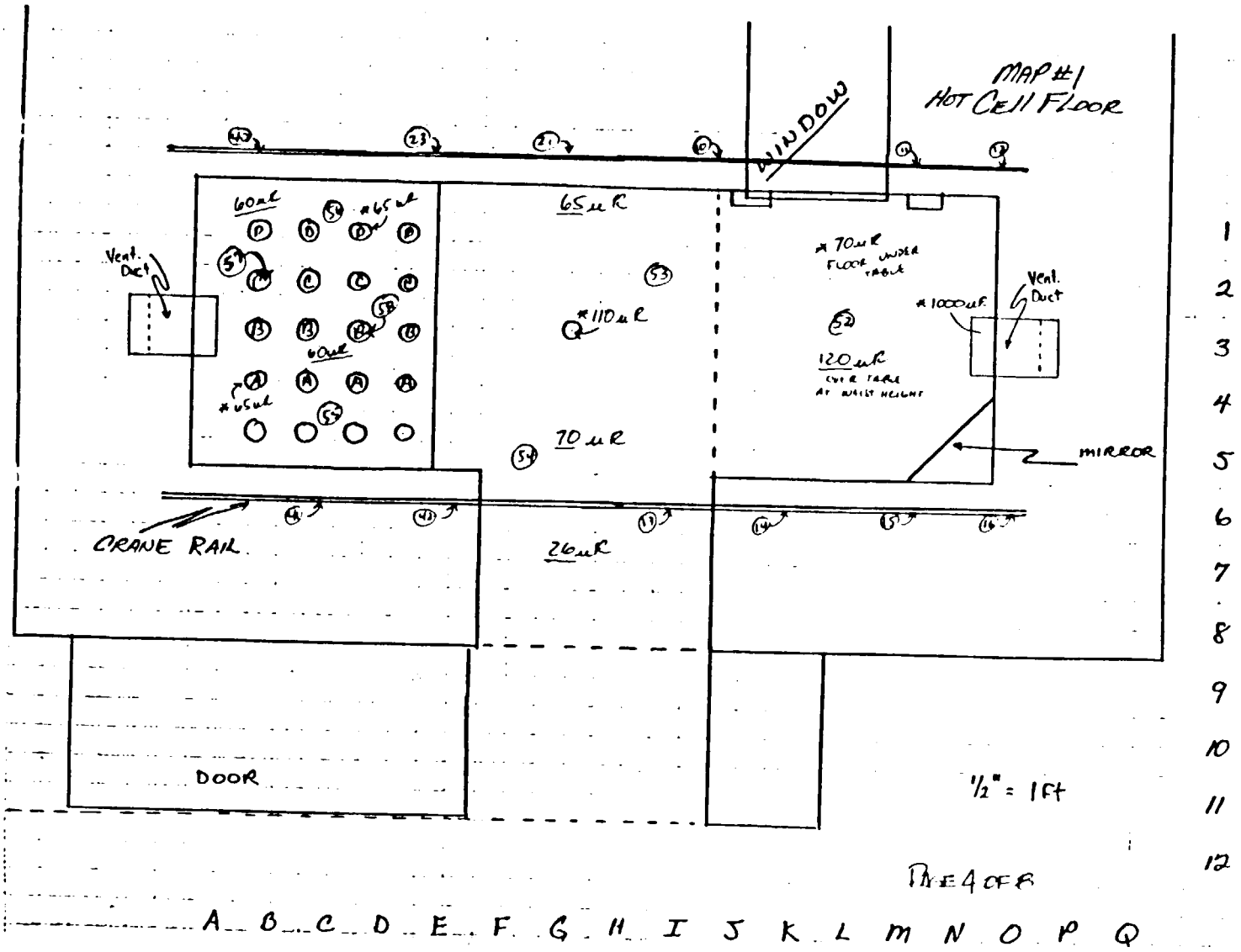
SWIPE PROBE NO.	ALPHA EQUIV. TO * 100 cm² PROBE	ALPHA EQUIV. TO * 100 cm² PROBE	BETA GAMMA EQUIV. TO * 100 cm² PROBE	BETA GAMMA EQUIV. TO * 100 cm² PROBE	dpm/hr ☐ BETA GAMMA ☐ NEUTRON ☐ mR/hr ☐	ITEM OR LOCATION
61			<1000			CELL NORTH WALL
62			<1000			SEE
63			<1000			MAP
64			<1000			# 4
65			<1000			CELL EAST WALL
66			<1000			SEE
67			<1000			MAP
68			<1000			# 3
69			<1000			CELL WEST WALL
70			<1000			SEE
71			<1000			MAP
72			<1000			# 3
73			<1000			CELL SOUTH WALL
74			<1000			SEE
75			<1000			MAP
76			<1000			#
77			<1000			5

SWIPE PROBE NO.	ALPHA EQUIV. TO * 100 cm² PROBE	ALPHA EQUIV. TO * 100 cm² PROBE	BETA GAMMA EQUIV. TO * 100 cm² PROBE	BETA GAMMA EQUIV. TO * 100 cm² PROBE	dpm/hr ☐ BETA GAMMA ☒ NEUTRON ☐ mR/hr ☒	ITEM OR LOCATION
					20	DOORWAY OF CELL (DATE / INITIAL)
					70	INSIDE CELL
					65	BACK OF CELL
					110	FLOOR DRAIN
					120	OVER TABLE
					380	VENT DUCT OPENING WEST WALL
					1000	TOP OF DUCT WEST WALL
					300	WATER HOSE ON CELL
					110	OVERHEAD AREA OVERHEAD RAIL & HOIST
					60	OVER STEEL WHEELS
					65	VENT DUCT EAST WALL
					140	1' FROM HOIST
				2000		TOP OF CART
				2000		FRONT LEFT WHEEL - CART
				3000		BACK LEFT WHEEL CART
				3000		BACK RIGHT WHEEL CART
				5000		FRONT RIGHT WHEEL CART
				2000		CART TRAY
				1500		CART TRAY

WARNING: FALSE STATEMENTS OR REPRESENTATIONS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES.

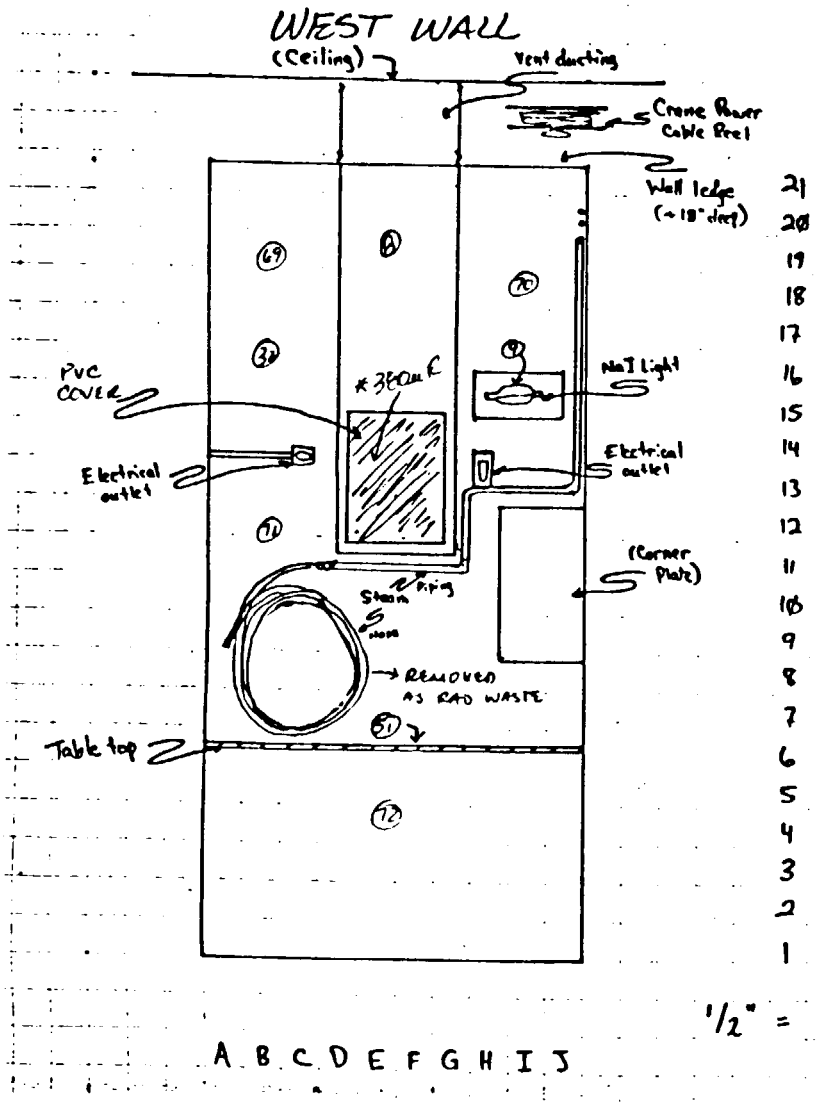
RADIOLOGICAL CONTROL

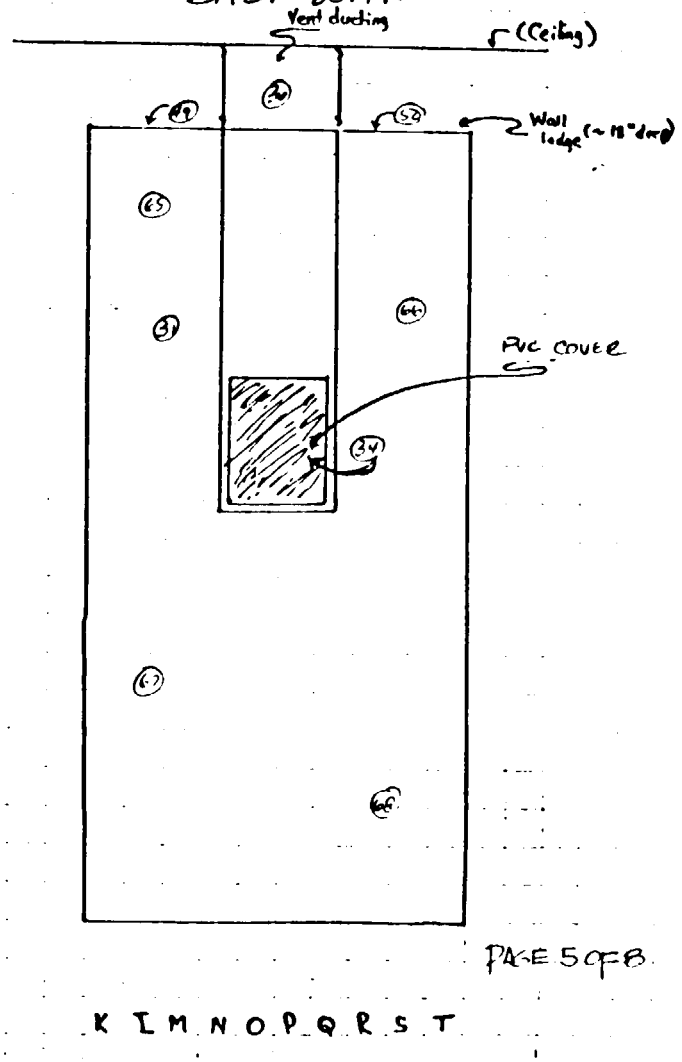
CHEM-NUCLEAR SYSTEMS INC



CHEM-NUCLEAR SYSTEMS, INC

MAP #3
HOT CELL INTERIOR



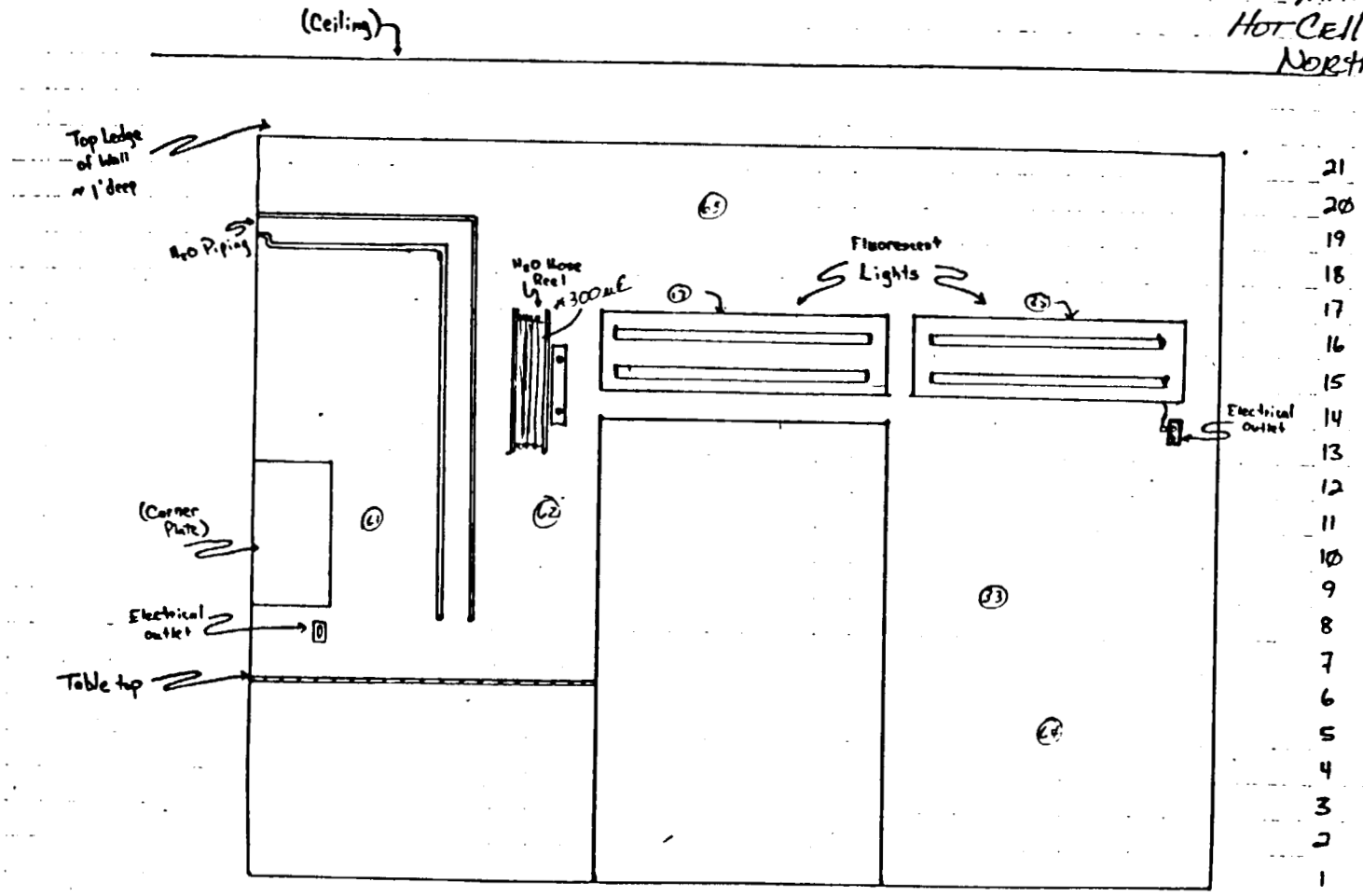


1/2" = 1ft

PAGE 5 OF 8

CHEM-NUCLEAR SYSTEMS INC

MAP #4
HOT CELL INTERIOR
NORTH WALL

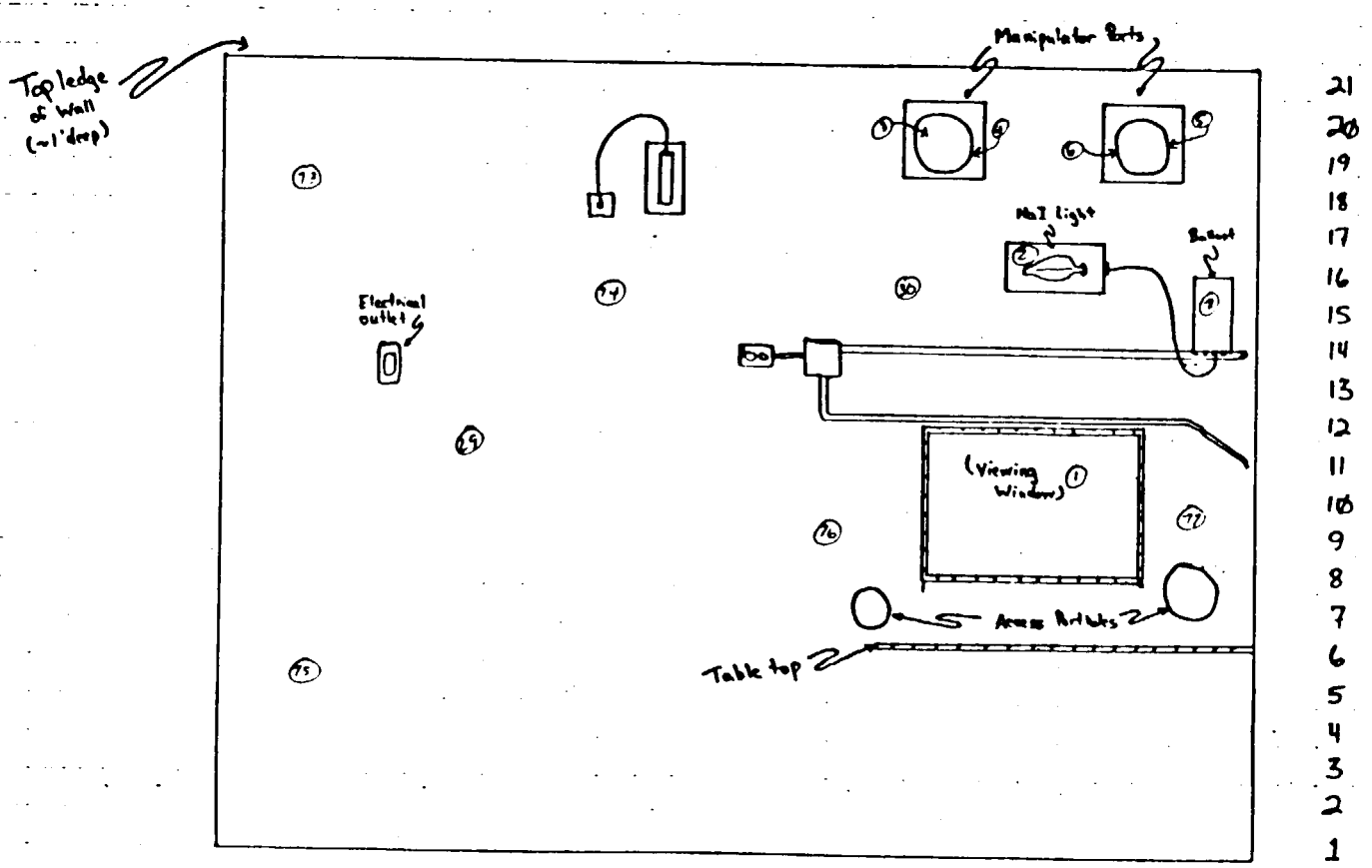


PAGE 6 OF 8

1/2" = 1ft

CHEM-NUCLEAR SYSTEMS, INC

MAP #5
HOT CELL INTERIOR
South Wall

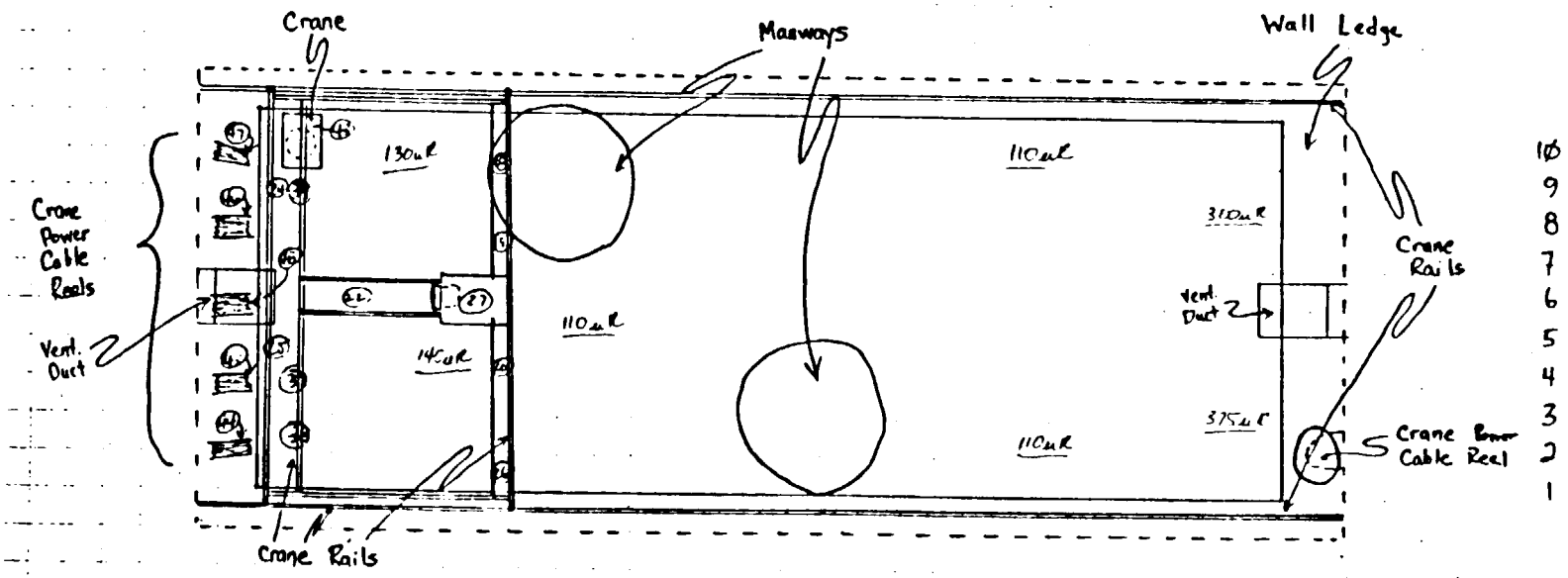


PAGE 7 OF 8

1/2" = 1 ft

CHEM-NUCLEAR SYSTEMS, INC

MAP #8
HOT CELL INTERIOR
CEILING



PAGE 8 OF 8
½" = 1ft

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION/RADIATION SURVEY REPORT

TO: HILBERT & ASSOCIATES

DATE: 9-1-86 | TIME START: | TIME FINISH: | PAGE 1 OF 1

ACTIVITY LOCATION: Bldg. 3192

PHONE:

☐ NO ACTION REQD ☐ CIRCLED SURVEY RESULTS REQUIRE DECONTAMINATE IMMEDIATELY & CONTACT

☐ DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND ☐ DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

COMMENTS: SMEARS OF CELL DOOR (ACCESSIBLE AREAS) AND DOOR TROUGH

PERMISSIBLE LEVELS
- ☐ < 220 dpm 100 cm² ALPHA
- ☐ < 220 dpm 100 cm² BETA GAMMA
- ☐ RESURVEY

CSLA AREA CONTROL LEVELS
- ☐ 220 dpm 100 cm² ALPHA
- ☐ 2200 dpm 100 cm² BETA GAMMA

☐ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEY ALPHA	CONTAMINATION SURVEY BETA GAMMA	RADIATION BETA GAMMA
SOURCE ID		HA 010	
SOURCE STRENGTH	dpm	13100 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1300 CPM	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND: dpm / mR/hr

REASON FOR SURVEY: ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

CONTAMINATION SURVEY	INSTRUMENT TYPE TAG#	ALPHA	BETA GAMMA
RADIATION SURVEY	INSTRUMENT TYPE TAG#	NEUTRON	FM-14 / 4041

INDEPENDENT RATION REVIEW: DATE:

SWIPE PROBE NO	ALPHA EQUIV TO dpm/100 cm²	ALPHA EQUIV TO dpm/100 cm²	BETA GAMMA EQUIV TO dpm/100 cm²	BETA GAMMA EQUIV TO dpm/100 cm²	☐ ALPHA ☐ BETA GAMMA ☐ NEUTRON ☐ MICROREM	ITEM OR LOCATION
1			1000			BACK OF CELL DOOR
2			<1000			"
3			<1000			"
4			1000			DOOR FRAME BEHIND CELL DOOR
5			2000			"
6			5000			"
7			<1000			DOOR TROUGH DOOR IN CLOSED POS.
8			<1000			"
9			<1000			"
10			<1000			"
11			<1000			"
12			<1000			WALL BEHIND DOOR
13			<1000			"
14			<1000			"
15			<1000			"
16			4000			TOP OF CELL DOOR AFTER VACUUMING
17			1000			"

SWIPE PROBE NO	ALPHA EQUIV TO dpm/100 cm²	ALPHA EQUIV TO dpm/100 cm²	BETA GAMMA EQUIV TO dpm/100 cm²	BETA GAMMA EQUIV TO dpm/100 cm²	☐ ALPHA ☐ BETA GAMMA ☐ NEUTRON ☐ MICROREM	ITEM OR LOCATION
18			10000			TOP OF CELL DOOR AFTER VACUUMING
19			8000			"
20			9000			"
21			45000			"
22			8000			"
23			13000			"
24						
25						
26						
27						
28						
29						
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* THE INSERTING, WILLFUL RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC

ENCLOSURE D.4
PAGE 1 OF 1

CONTAMINATION RADIATION SURVEY REPORT

HILBERT & ASSOCIATES INC.

DATE: 8-20-86 | TIME START: | TIME FINISH: | PAGE 1 OF 3

ACTIVITY LOCATION: TOP OF HOT CELL | SURVEYOR: Dyl Riggi | PHONE:

☐ NO ACTION REQD ☐ CIRCLED READINGS OF CONCERN EVALUATE IMMEDIATELY & CONTACT SUPERVISOR FOR RESURVEY

DAILY ☐ WEEKLY ☐ MONTHLY ☐ QUARTERLY ☐ CONTAMINATION AND DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

INFORMATIONAL - TO DETERMINE STATUS OF AREA AFTER CLEAN-UP

PERMISSIBLE LEVELS
☐ < 200 dpm 100 cm² ALPHA
☐ < 200 dpm 100 cm² BETA GAMMA
☐ RESURVEY

CSA AREA CONTROL LEVELS
☐ 200 dpm 100 cm² ALPHA
☐ 200 dpm 100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA GAMMA	RADIATION BETA GAMMA
SOURCE ID: HA 010			
SOURCE STRENGTH: 13,100 DPM	dpm	13100 dpm	mrem
INSTRUMENT RESPONSE: 1300 CPM	dpm	1300 CPM	mrem
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☒ UNSAT ☐

CONTAMINATION SURVEY	INSTRUMENT TYPE/SERIAL	ALPHA	BETA GAMMA
RADIATION SURVEY	INSTRUMENT TYPE/SERIAL	NEUTRON	RM-14/4041 M-19/32871

INDEPENDENT REVIEW: _____ DATE: _____

BETA GAMMA BACKGROUND: dpm 100 cm² mrem

REASON FOR SURVEY: ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV TAP dpm/probe	ALPHA EQUIV TAP dpm/100 cm²	BETA GAMMA EQUIV CS dpm/probe	BETA GAMMA EQUIV CS dpm/100 cm²	mrem/hr ☐ BETA GAMMA ☒ NEUTRON ☐ MICROREM ☒	ITEM OR LOCATION
1			< 1000			SEE ATTACHED MAP
2			< 1000			
3			< 1000			
4			< 1000			
5			1000	17		
6			< 1000	10		
7			< 1000			
8			< 1000			
9			< 1000	9		
10			3000	90		SEE SWEAR PAGE 2 #51
11			< 1000	18		
12			< 1000	22		
13			4000			
14			< 1000			
15			< 1000			
16			< 1000			
17			< 1000			
18			< 1000			SEE ATTACHED MAP
19			1000	40		
20			< 1000			
21			1000			
22			< 1000			
23			< 1000			
24			< 1000	14		
25			< 1000			
26			< 1000	15		
27			< 1000	15		
28			< 1000			
29			< 1000	14		
30			< 1000	45		
31			< 1000	14		
32			5400	360		SEE SWEAR PAGE 2 #50
33			< 1000			
34			< 1000			
35			< 1000			
36			< 1000			
37			< 1000			
38			< 1000			
39			< 1000			
40			< 1000			

* THE FOLLOWING & MULTIPLE RECORDS OF FACTS, THE OPERATIONAL STATEMENTS OR ENTRIES CONTAINED IN THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

RADIOLOGICAL CONTROL

ENCLOSURE D.5
PAGE 1 OF 3

CHEM-NUCLEAR SYSTEMS, INC

CONTAMINATION RADIATION SURVEY REPORT

TO: HILBERT & ASSOCIATES

DATE: 8-20-86 | TIME START: | TIME FINISH: | PAGE 2 OF 3

ACTIVITY LOCATION: TOP OF HOT CELL

PHONE:

☐ NO ACTION REQ'D ☐ CIRCLE READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

INFORMATIONAL - TO DETERMINE STATUS OF AREA AFTER CLEAN-UP

PERMISSIBLE LEVELS
☐ < 220 dpm 100 cm² ALPHA
☐ < 220 dpm 100 cm² BETA GAMMA
☐ RESURVEY

CONTROL AREA CONTROL LEVELS
☐ 22 dpm 100 cm² ALPHA
☐ 220 dpm 100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS		RADIATION
	ALPHA	BETA GAMMA	BETA GAMMA
SOURCE ID: H4-01C			
SOURCE STRENGTH: 13600 dpm	dpm	13800 dpm	
INSTRUMENT RESPONSE: 1300 CPM	dpm	1300 CPM	
	SAT ☐ LIN/AT ☐	SAT ☒ LIN/AT ☐	SAT ☒ LIN/AT ☐

CONTAMINATION SURVEY	INSTRUMENT TYPE/SERIAL NO.	ALPHA	BETA GAMMA RM-14 / 4041
RADIATION SURVEY	INSTRUMENT TYPE/SERIAL NO.	NEUTRON	BETA GAMMA M-19 / 32871

INDEPENDENT RADIOLOGICAL REVIEW: _____ DATE: _____

BETA GAMMA BACKGROUND: _____ dpm _____ mR/hr

REASON FOR SURVEY: ☐ PROCEDURE NO. _____ ☐ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV. TO dpm/PROBE	ALPHA EQUIV. TO dpm/100 cm²	BETA GAMMA EQUIV. TO dpm/PROBE	BETA GAMMA EQUIV. TO dpm/100 cm²	MICROR/hr ☒ BETA GAMMA ☐ NEUTRON ☐ MICROR/hr ☒	ITEM OR LOCATION
41				<1000	7	SEE ATTACHED MAP
42				<1000	10	
43				<1000		
44				<1000		
45				<1000		
46				12000		BEAM OVER CLASSROOM
47				<1000		A/C DUCT CLASSROOM
48				<1000		A/C DUCT CLASSROOM
49				<1000		BEAM SURFACE
50				<1000		RIGHT SIDE VENT. RISER (AFTER WINDOW)
51				<1000		LEFT SIDE VENT. RISER AFTER WINDOW
52				<1000		UPPERMOST A/C DUCT
53				<1000		UPPERMOST A/C DUCT

SWIPE PROBE NO.	ALPHA EQUIV. TO dpm/PROBE	ALPHA EQUIV. TO dpm/100 cm²	BETA GAMMA EQUIV. TO dpm/PROBE	BETA GAMMA EQUIV. TO dpm/100 cm²	MICROR/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MICROR/hr ☐	ITEM OR LOCATION
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

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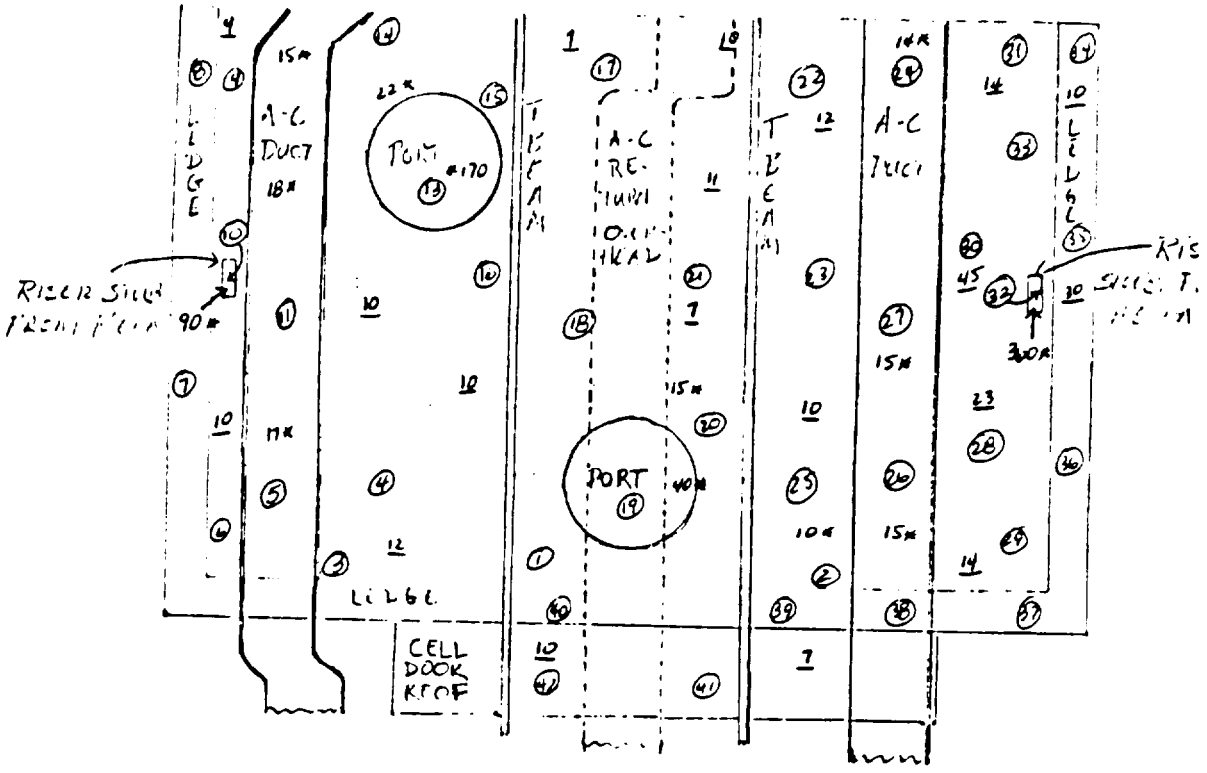
RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS INC

CHEM-NUCLEAR SYSTEMS, INC

North



HOT CELL ROOF

ALL DOSE RATE READINGS IN MICRO R/HOUR
10 GENERAL AREA READING WAIST HEIGHT
10* CONTACT READING

PAGE 3 OF 3

CONTAMINATION RADIATION SURVEY REPORT

TO: Hilbert and Associates

DATE: 8-22-86

TIME START:

TIME COMP:

PAGE 1 OF 2

LOCATION: 3192 - AC DUCT

SURVEYOR: H. Fuller

☐ NO ACTION REQD ☐ CIRCLED READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

DAILY / WEEKLY / MONTHLY / COMPLETE ☐ CONTAMINATION AND ☐ RADIATION SURVEY

INFORMATIONAL - TO DETERMINE STATUS OF AREA AFTER CLEAN UP - (SEE ATTACHED MAP)

PERMISSIBLE LEVELS
- ☐ < 22 dpm/100 cm² ALPHA
- ☐ < 220 dpm/100 cm² BETA GAMMA
- ☐ RESURVEY

CSCA AREA CONTROL LEVELS
- ☐ 22 dpm/100 cm² ALPHA
- ☐ 2200 dpm/100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS		RADIATION
	ALPHA	BETA GAMMA	BETA GAMMA
SOURCE ID		S# F43-85 Tc99	
SOURCE STRENGTH	dpm	13,100 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	14,000 dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND: dpm / mR/hr

REASON FOR SURVEY: ☐ PROCEDURE NO. ☒ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV TO dpm/PROBE	ALPHA EQUIV TO dpm/100 cm²	BETA GAMMA EQUIV TO dpm/PROBE	BETA GAMMA EQUIV TO dpm/100 cm²	ALPHA ☐ BETA GAMMA ☐ NEUTRON ☐ MR/HR/hr ☐	ITEM OR LOCATION
1			25,000	2,500		A-C DUCTING - SEE MAP
2			8,000	1,000		
3			6,000	1,000		
4			10,000	<1,000		
5			10,000	1,000		
6			8,000	<1,000		
7			6,000	<1,000		
8			11,000	<1,000		
9			8,000	3,000		
10			2,000	<1,000		
11			3,000	<1,000		
12			2,000	<1,000		
13			6,000	<1,000		
14			6,000	<1,000		
15						
16						
17						

CONTAMINATION SURVEY / RADIATION SURVEY	INSTRUMENT TYPE / INSTRUMENT TYPE	ALPHA / NEUTRON	BETA GAMMA / MR/HR/hr
			LUD-3/31180

INDEPENDENT RADIOLOGICAL REVIEW: DATE

SWIPE PROBE NO.	ALPHA EQUIV TO dpm/PROBE	ALPHA EQUIV TO dpm/100 cm²	BETA GAMMA EQUIV TO dpm/PROBE	BETA GAMMA EQUIV TO dpm/100 cm²	ALPHA ☐ BETA GAMMA ☐ NEUTRON ☐ MR/HR/hr ☐	ITEM OR LOCATION
18						
19						
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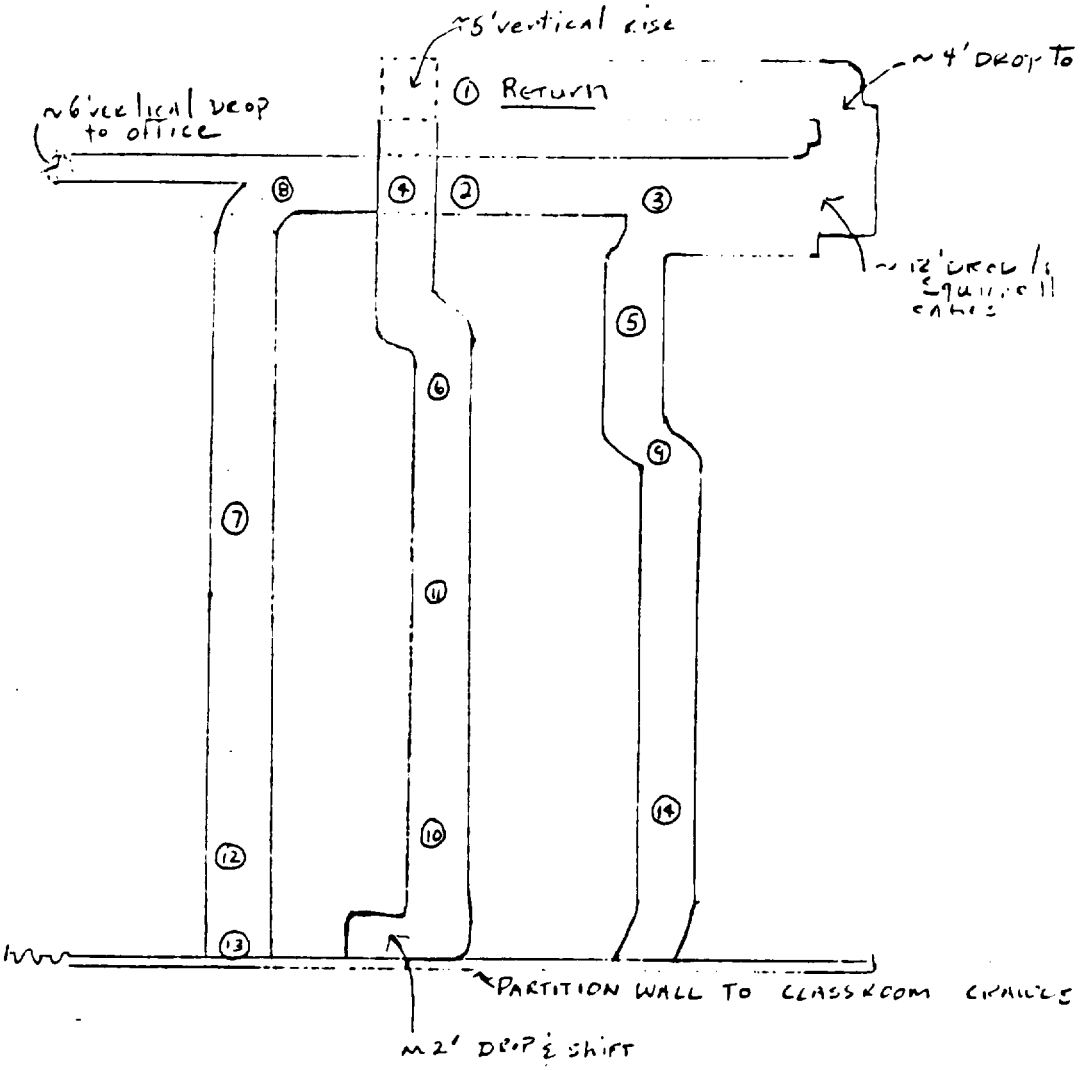
RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS INC

ENCLOSURE D.6
PAGE 1 OF 2



AIR CONDITIONING VENTILATION DUCTING

PAGE 2 OF 2 . 8-22-86

CONTAMINATION RADIATION SURVEY REPORT

ACTIVITY LOCATION: 3192 OFFICE ROOM

HILBERT AND ASSOCIATES

H. Fuller

DATE: 8-23-86

PAGE 1 OF 2

☐ NO ACTION REQD ☐ CIRCLED READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEY COORD FOR RESURVEY

CONTAMINATION AND RADIATION SURVEY

INFORMATIONAL; SWIPES AND DIRECT READINGS ARE LIMITED DUE TO THE LACK OF ACCESSIBILITY IN THIS AREA - (SEE ATTACHED MAP)

PERMISSIBLE LEVELS
- ☐ < 220 dpm/100 cm² ALPHA
- ☐ < 220 dpm/100 cm² BETA GAMMA
- ☐ RESURVEY

ESCA AREA CONTROL LEVELS
- ☐ 220 dpm/100 cm² ALPHA
- ☐ 220 dpm/100 cm² BETA GAMMA

☐ OTHER (SEE COMMENTS)

CONTAMINATION SURVEY / RADIATION SURVEY: CUD-3/31180

INDEPENDENT RADIATION REVIEW: DATE:

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	BETA GAMMA	RADIATION BETA GAMMA
SOURCE ID			SN 943108 Tc 99
SOURCE STRENGTH	dpm	dpm	13,100 mR/hr
INSTRUMENT RESPONSE	dpm	dpm	14,000 mR/hr
	SAT ☐ UNSAT ☐	SAT ☐ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND: dpm

REASON FOR SURVEY
- ☐ PROCEDURE NO
- ☒ SPECIAL
- ☐ ROUTINE

SWIPE PROBE NO	ALPHA EQUIV TO dpm/PROBE	dpm/100 cm²	BETA GAMMA EQUIV TO dpm/PROBE	dpm/100 cm²	dpm/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MICROR/hr ☐	ITEM OR LOCATION
1			1500	4,000		BLOCK WALL TOP
2			1,000	2,000		INSULATION
3			1,200	1500		"
4			1,000	4,000		"
5			1,500	1,500		"
6						
7						
8						
9						
10						
11						
12						
13						
14						
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THE PROBE SWIPES WILL BE RECORDED ON FACSIMILE FORM. OBTAINING FALSE STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

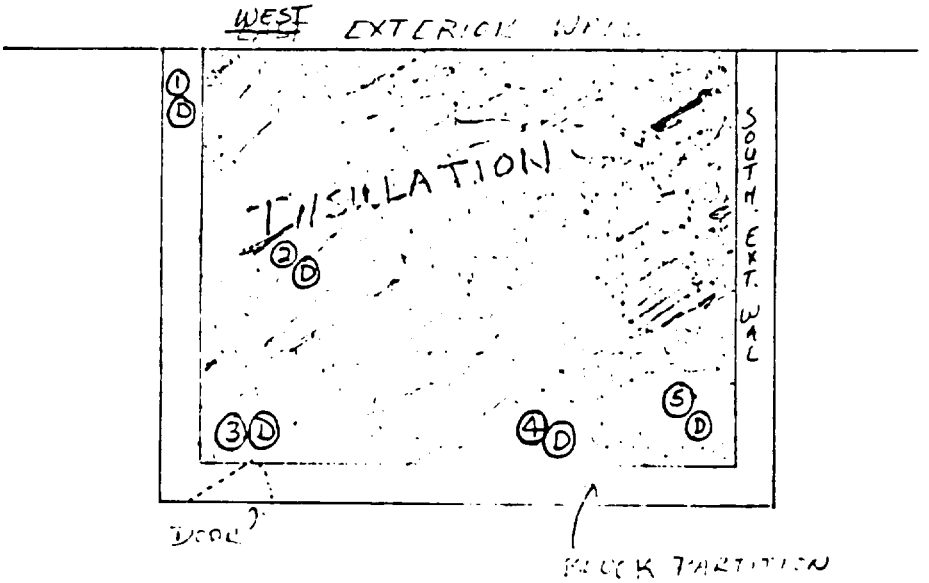
RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC

ENCLOSURE D.7

PAGE 1 OF 2

CHEM-NUCLEAR SYSTEMS, INC



ROOF OF OFFICE

O = SWIPE LOCATION
(D) = DIRECT FRISK PERFORMED

PAGE 2 OF 2 8-23-86

CONTAMINATION/RADIATION SURVEY REPORT

ACTIVITY/LOCATION: 3192 Truss Sys.

SURVEYOR: H. Fuller

PHONE:

DATE: 8-22-86

TIME START:

TIME COMP:

PAGE 1 OF 2

☐ NO ACTION REQD ☐ CIRCLED READING: DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

CONTAMINATION AND RADIATION SURVEY

Informational after wipe down - (SEE ATTACHED MAP)

PERMISSIBLE LEVELS
☐ < 220 dpm/100 cm² ALPHA
☐ < 200 dpm/100 cm² BETA GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm/100 cm² ALPHA
☐ 200 dpm/100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA GAMMA	RADIATION BETA GAMMA
SOURCE ID		S# 043/85 Tc99	
SOURCE STRENGTH	dpm	13,100 dpm	mR/h
INSTRUMENT RESPONSE	dpm	14,000 dpm	mR/h
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND dpm mR/h

CONTAMINATION SURVEY	INSTRUMENT SER. NO.	ALPHA	BETA GAMMA
RADIATION SURVEY	INSTRUMENT SER. NO.	NEUTRON	LUD-2/31180

INDEPENDENT RADIATION REVIEW: DATE:

REASON FOR SURVEY ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

SWIPE PROBE NO	ALPHA EQUIV. TO ... dpm/PROBE	ALPHA EQUIV. TO ... dpm/100 cm²	BETA GAMMA EQUIV. TO ... dpm/PROBE	BETA GAMMA EQUIV. TO ... dpm/100 cm²	ITEM OR LOCATION
1			66,000	2,000	T-beam
2			1,000	<1,000	Diagonal
3			1,000	1,000	"
4			3,000	4,000	TRUSS, UPPER member
5			6,000	1,000	" Lower "
6			8,000	1,000	I-beam
7			3,000	<1,000	"
8			1,000	<1,000	T-Beam
9			3,500	1,000	I-Beam
10			2,500	1,000	"
11			6,000	1,500	T-Beam
12			5,000	7,500	Diagonal
13			3,000	5,000	Truss-Upper Member
14			2,000	<1,000	I-Beam
15			4,000	<1,000	I-Beam
16			6,000	6,000	Truss-Upper Member
17			5,000	1,000	" - Lower Member
18			1,000	<1,000	Truss-Upper member
19			1,000	1,000	I-beam
20			3,000	2,000	Truss-upper member
21			1,200	2,000	" - lower member
22			1,000	1,000	" - upper member
23			2,500	<1,000	" - lower member
24			4,000	1,000	T-beam
25			8,000	<1,000	Truss-Lower member
26			8,000	13,000	" - upper member
27			11,000	1,000	I-beam
28			<1,000	<1,000	Truss-upper member
29			2,000	1,000	I-Beam
30			<1,000	<1,000	"
31			2,000	1,000	T-Beam
32			<1,000	<1,000	"
33			4,000	<1,000	I-Beam
34			<1,000	<1,000	T-Beam
35			2,000	4,000	Ridge beam
36			2,000	5,000	" "
37			1,000	<1,000	I-Beam
38			<1,000	<1,000	"
39			<1,000	<1,000	"
40			1,000	<1,000	"

☐ CHEMICAL ☐ BETA GAMMA ☐ NEUTRON ☐ MICROBIAL

THE FOLLOWING WILLFUL REPORTING OF FALSE OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

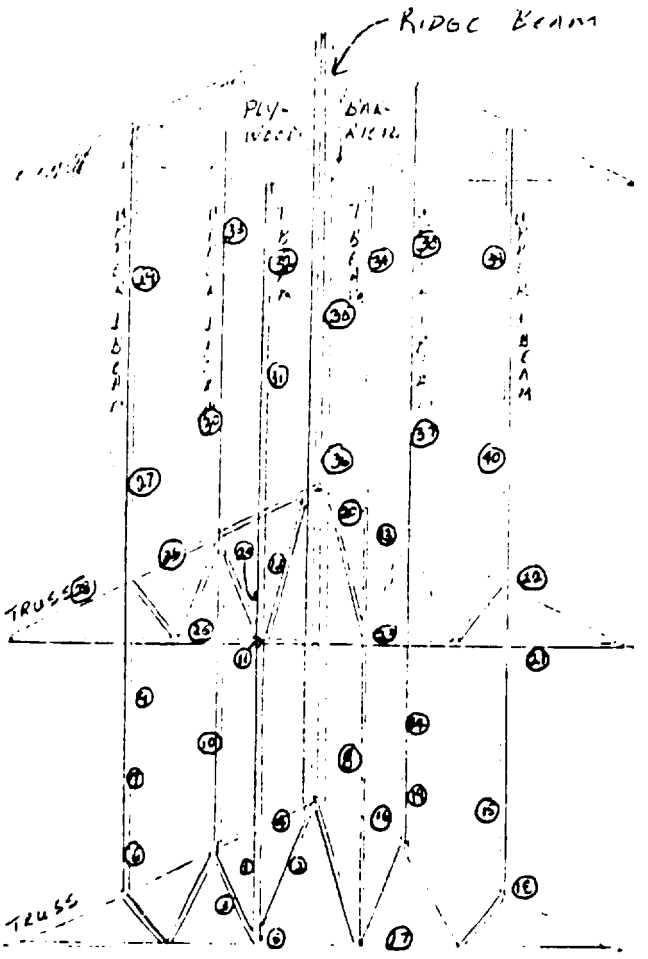
RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC.

ENCLOSURE D.8
PAGE 1 OF 2

CHEM-NUCLEAR SYSTEMS, INC

NORTH



ROOF TRUSS SYSTEM

P 2 of 2 8-22-86 INFORMATIONAL SURVEY AFTER WIPE DOWN OF TRUSS system

CONTAMINATION RADIATION SURVEY REPORT

TO: HILBERT & ASSOCIATES

DATE: 8-25-86 | TIME START: | TIME FINISH: | PAGE 1 OF 2

AREA: OVERHEAD IN BLDG CLASSROOM 3142

SURVEYOR: Jim Riggs | PHONE:

☐ NO ACTION REQ'D ☐ CIRCULATE FINDINGS, DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

DAILY ☐ WEEKLY ☐ MONTHLY ☐ COMMENTS: CONTAMINATION AND DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

INFORMATIONAL - TO DETERMINE INITIAL STATUS OF AREA OVER CLASSROOM.

PERMISSIBLE LEVELS
☐ < 22[illegible] dpm 100 cm² ALPHA
☐ < 22[illegible] dpm 100 cm² BETA GAMMA
☐ RESURVEY

COMPARE AREA CONTROL LEVELS
☐ 22[illegible] dpm 100 cm² ALPHA
☐ 22[illegible] dpm 100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA	CONTAMINATION SURVEYS BETA GAMMA	RADIATION BETA GAMMA
SOURCE ID			
SOURCE STRENGTH	dpm	13100 dpm	mR/hr
INSTRUMENT RESPONSE	dpm	1300 CPM	mR/hr
	SAT ☐ UNSAT ☐	SAT ☒ UNSAT ☐	SAT ☐ UNSAT ☐

CONTAMINATION SURVEY | INDEPENDENT INSTRUMENT | ALPHA | BETA GAMMA RM-14 / 4041

RADIATION SURVEY | INDEPENDENT INSTRUMENT | NEUTRON

INDEPENDENT RADIATION REVIEW | DATE

BETA GAMMA BACKGROUND dpm mR/hr

REASON FOR SURVEY ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV. TH-1 dpm/probe	ALPHA EQUIV. TH-1 dpm/100 cm²	BETA GAMMA EQUIV. Cs dpm/probe	BETA GAMMA EQUIV. Cs dpm/100 cm²	mrem/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MICROR/hr ☐	ITEM OR LOCATION
1			1000			SEE MAP / T-BEAM
2			1000			INSULATION
3			1000			INSULATION
4			2500			DOWNWARD OF RETURN
5			4000			INSULATION
6			2000			T-BEAM
7			<1000			T-BEAM
8			1000			T-BEAM
9			<1000			T-BEAM
10			<1000			AIR DUCT
11			1500			AIR DUCT
12			1000			AIR DUCT
13			<1000			AIR DUCT
14			<1000			T-BEAM
15			<1000			T-BEAM
16			<1000			INSULATION
17			1000			INSULATION
18			<1000			SEE MAP / BACK WALL AT END OF BLDG
19			<1000			BACK WALL AT END OF BLDG
20			<1000			I-BEAM
21			<1000			I-BEAM
22						
23						
24						
25						
26						
27						
28						
29						
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31						
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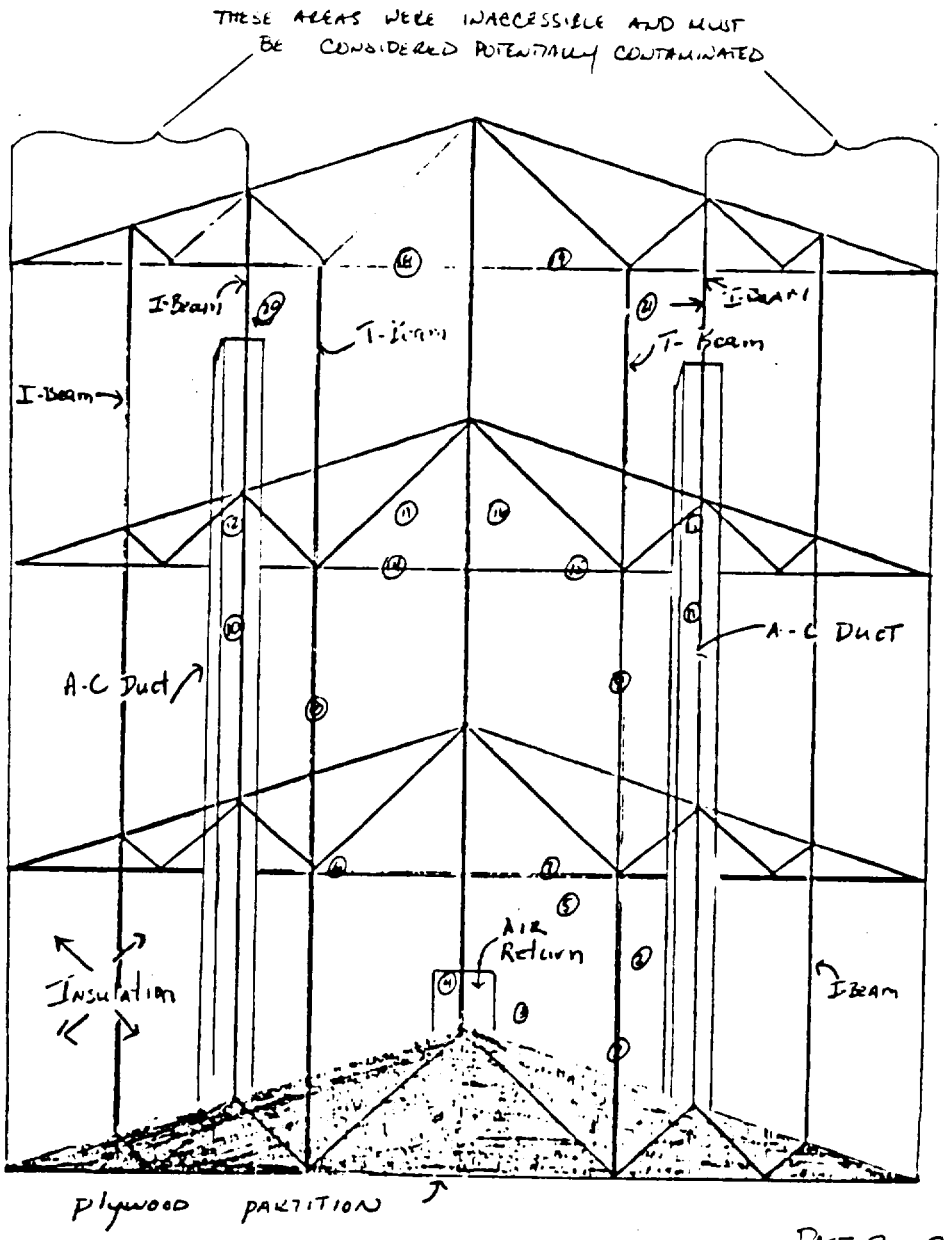
THE RN, WING & WILLFUL RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS FORM MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES

RADIOLOGICAL CONTROL

EXHIBIT D9
PAGE 1 OF 2

CHEM-NUCLEAR SYSTEMS INC

BLDG 3192 CLASSROOM OVERHEAD



PAGE 2 OF 2

CONTAMINATION RADIATION SURVEY REPORT

TO: HILBERT E ASSOC.

DATE: 8-29-86 | TIME START: 1600 | TIME COMP: 1800 | PAGE 1 OF 4

ACTIVITY/LOCATION: SEURLE STORAGE CELL AFTER SLAPBLING

SURVEYOR: W. Fuller | PHONE:

☐ DAILY ☐ WEEKLY ☐ MONTHLY CONTAMINATION AND ☐ DAILY ☐ WEEKLY ☐ MONTHLY RADIATION SURVEY

☐ NO ACTION REQD ☐ CIRCLED READINGS: DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

COMMENTS: SEE MAP, SEE * ON MAP

PERMISSIBLE LEVELS
☐ < 220 dpm 100 cm² ALPHA
☐ < 220 dpm 100 cm² BETA GAMMA
☐ RESURVEY

CSCA AREA CONTROL LEVELS
☐ 220 dpm 100 cm² ALPHA
☐ 220 dpm 100 cm² BETA GAMMA

☒ OTHER (SEE COMMENTS)

CONTAMINATION SURVEY	INSTRUMENT TYPE/SERIAL NO	ALPHA	BETA GAMMA RM 14 2777
RADIATION SURVEY	INSTRUMENT TYPE/SERIAL NO	NEUTRON	mR/hr GAMMA

INDEPENDENT RADIOLOGICAL REVIEW _____ DATE _____

SOURCE CHECK DATA	CONTAMINATION SURVEYS ALPHA		BETA GAMMA		RADIATION BETA GAMMA	
SOURCE ID			243-85 Tc99			
SOURCE STRENGTH	dpm		13,100 dpm		mR/hr	
INSTRUMENT RESPONSE	dpm		14,000 dpm		mR/hr	
	SAT	UNSAT	SAT	UNSAT	SAT	UNSAT
	☐	☐	☒	☐	☐	☐

BETA GAMMA BACKGROUND 500 dpm mR/hr

REASON FOR SURVEY ☐ PROCEDURE NO. _____ ☒ SPECIAL ☐ ROUTINE

SWIPE PROBE NO.	ALPHA EQUIV TWP dpm/probe	ALPHA EQUIV TWP dpm/100 cm²	BETA GAMMA EQUIV CS dpm/probe	BETA GAMMA EQUIV CS dpm/100 cm²	mR/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MICRO R/hr ☐	ITEM OR LOCATION
1			SEE MAP	1000		FOYER
2				< 1000		"
3				< 1000		"
4				< 1000		"
5				< 1000		SLAB FLOOR
6				< 1000		"
7				< 1000		"
8				< 1000		"
9				< 1000		"
10				< 1000		"
11				< 1000		"
12				< 1000		"
13				< 1000		"
14				< 1000		"
15				< 1000		PEDESTAL
16				< 1000		"
17				< 1000		E-WALL
18			SEE MAP	< 1000		E-WALL
19				< 1000		"
20				< 1000		"
21				< 1000		"
22				< 1000		N-WALL
23				< 1000		"
24				< 1000		"
25				< 1000		"
26				< 1000		"
27				< 1000		"
28				< 1000		W-WALL
29				< 1000		"
30				< 1000		"
31				< 1000		"
32				< 1000		"
33				< 1000		"
34				< 1000		CEILING
35				< 1000		"
36				< 1000		"
37				< 1000		"
38				< 1000		"
39				< 1000		"
40				< 1000		"

* THE RADIOLOGICAL WRITTEN RECORDING OF TABLE FOR DOSE OR RADIOLOGICAL EXPOSURE ENTRIES ON THIS DOCUMENT MAY BE PURCHASABLE AS A FEDERAL OR STATE RECORD

RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS, INC

ENCLOSURE D.10
PAGE 1 OF 4

CONTAMINATION RADIATION SURVEY REPORT

TO: HiA

DATE | TIME START | TIME COMP. | PAGE 2 OF 4

ACTIVITY LOCATION | SURVEYOR | PHONE

☐ NO ACTION REQD ☐ CIRCLED READINGS - DECONTAMINATE IMMEDIATELY & CONTACT SURVEYOR FOR RESURVEY

DAILY ☐ WEEKLY ☐ MONTHLY ☐ CONTAMINATION AND DAILY ☐ WEEKLY ☐ MONTHLY ☐ RADIATION SURVEY

COMMENTS: CONTINUATION OF SOURCE STORAGE CELL TOP SURVEY

PERMISSIBLE LEVELS
- ☐ < 220 dpm 100 cm² ALPHA
- ☐ < 2200 dpm 100 cm² BETA GAMMA
- ☐ RESURVEY

CSCA AREA CONTROL LEVELS
- ☐ 220 dpm 100 cm² ALPHA
- ☐ 2200 dpm 100 cm² BETA GAMMA

☐ OTHER (SEE COMMENTS)

SOURCE CHECK DATA	CONTAMINATION SURVEYS		RADIATION
	ALPHA	BETA GAMMA	BETA GAMMA
SOURCE ID			
SOURCE STRENGTH	dpm	dpm	mR/hr
INSTRUMENT RESPONSE	dpm	dpm	mR/hr
	SAT ☐ UNSAT ☐	SAT ☐ UNSAT ☐	SAT ☐ UNSAT ☐

BETA GAMMA BACKGROUND dpm mR/hr

REASON FOR SURVEY ☐ PROCEDURE NO. ☐ SPECIAL ☐ ROUTINE

CONTAMINATION SURVEY	INSTRUMENT TYPE & NO.	ALPHA	BETA GAMMA
RADIATION SURVEY	INSTRUMENT TYPE & NO.	NEUTRON	BETA GAMMA

INDEPENDENT RADCON REVIEW _____ DATE _____

SWIPE PROBE NO.	ALPHA EQUIV Th-232 dpm/PROBE	ALPHA EQUIV Th-232 dpm/100 cm²	BETA GAMMA EQUIV Cs-137 dpm/PROBE	BETA GAMMA EQUIV Cs-137 dpm/100 cm²	mrem/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MICROR/hr ☐	ITEM OR LOCATION
41			SEE MAP	<1000		DOOR - TOP
42				<1000		" - INSIDE
43				<1000		" INS OF TOP OF BET-TOM EDGE
44				<1000		" EDGE
45				<1000		INSIDE ROOF VENT
46				<1000		S-WALL
47				<1000		"
48				<1000		"
49				<1000		"
50				<1000		"
51				<1000		PEDESTAL - SIDE
52						
53						
54						
55						
56						
57						
58						
59						
60						

SWIPE PROBE NO.	ALPHA EQUIV Th-232 dpm/PROBE	ALPHA EQUIV Th-232 dpm/100 cm²	BETA GAMMA EQUIV Cs-137 dpm/PROBE	BETA GAMMA EQUIV Cs-137 dpm/100 cm²	mrem/hr ☐ BETA GAMMA ☐ NEUTRON ☐ MICROR/hr ☐	ITEM OR LOCATION
61						
62						
63						
64						
65						
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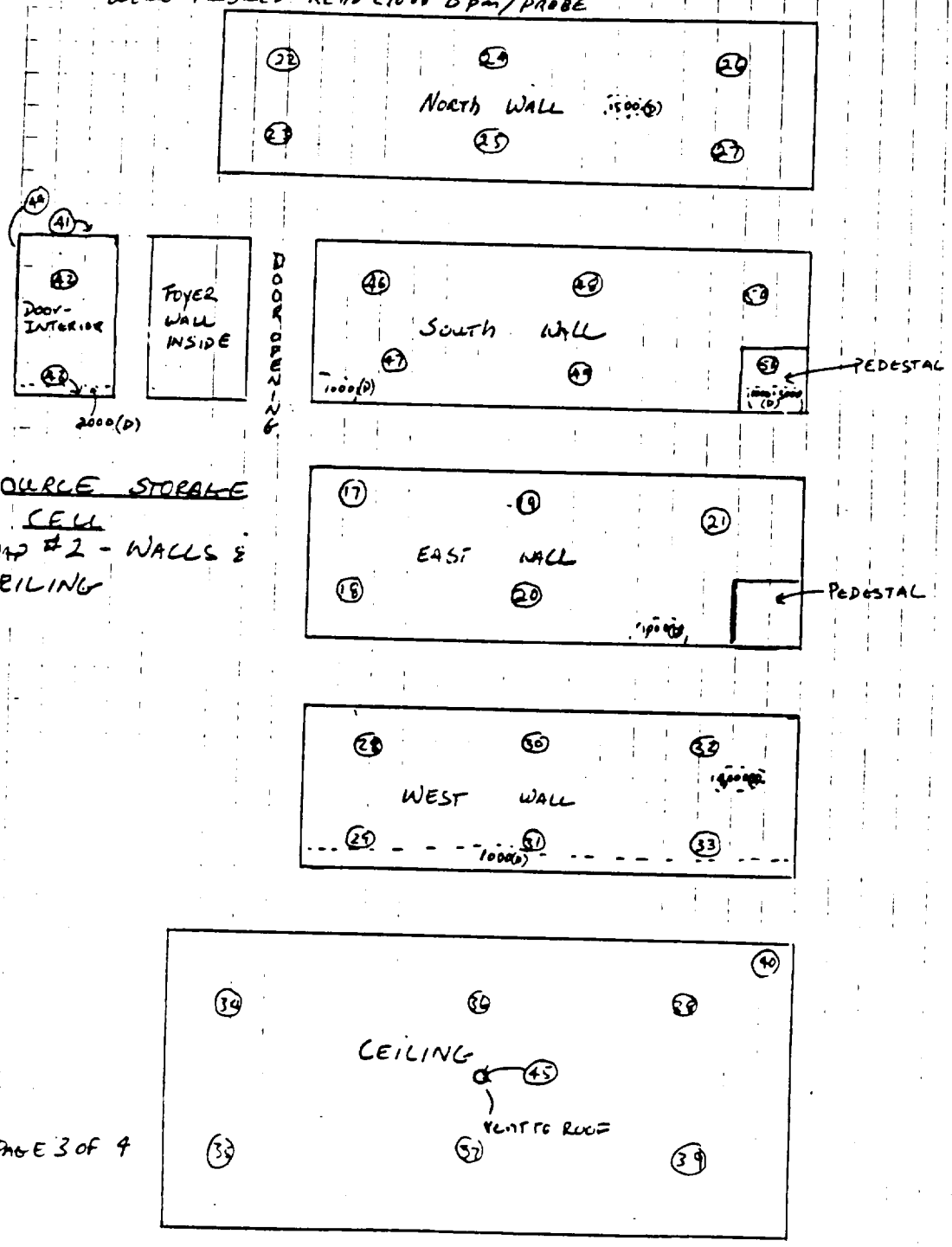
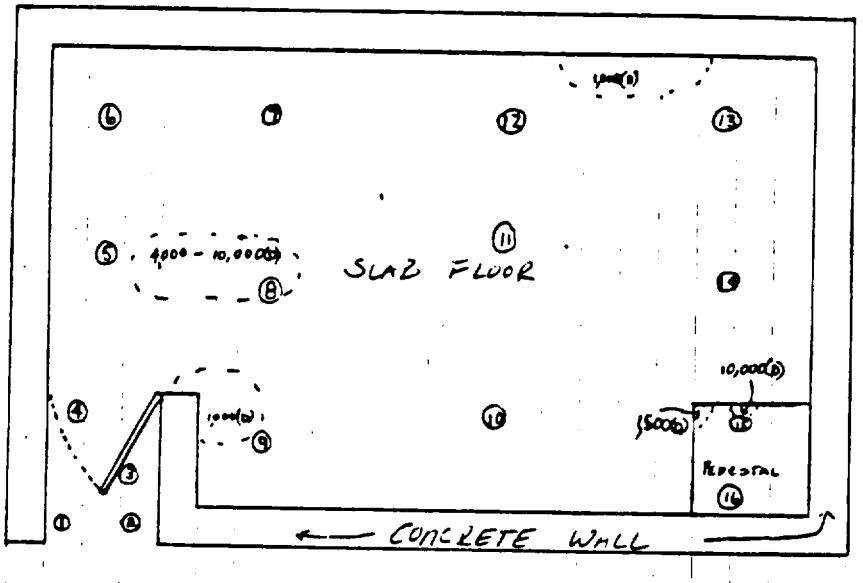
RADIOLOGICAL CONTROL

CHEM-NUCLEAR SYSTEMS INC

(D) AFTER READING DENOTES DIRECT FRISK
* ALL AREAS DESIGNATED W/ BROKEN LINES (- - - -) READ W/ FRISKER PROBE (SHIELDED) READINGS ARE IN DPM/PROBE. H.F. / ALL OTHER AREAS THAT WERE FRISKED READ <1000 DPM/PROBE



SOURCE STORAGE CELL
MAP #2 - WALLS & CEILING



SOURCE STORAGE CELL

MAP #1 - FLOOR

ALL OTHER FRISKED AREAS READ <1000 DPM/probe

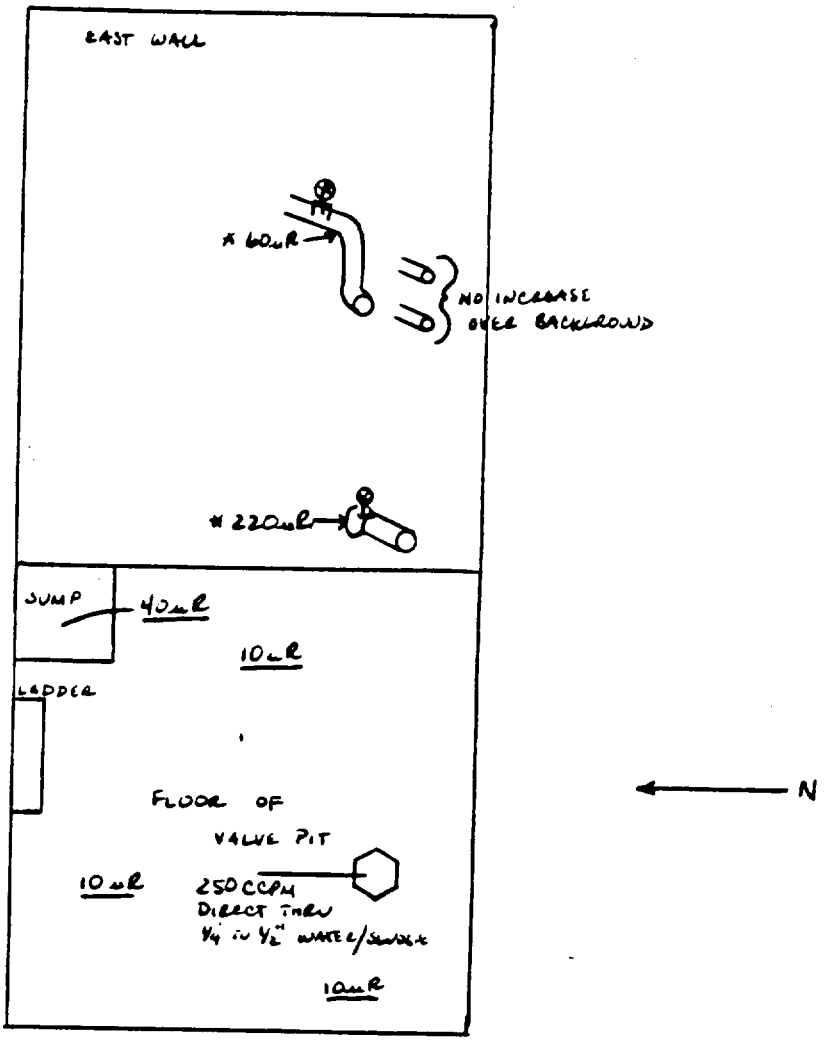
* ALL AREAS DESIGNATED WITH BROKEN LINES (- - - -) READ DIRECT FRISK WITH SHIELDED FRISKER PROBE. READINGS ARE IN DPM/probe. H.F.

(D) AFTER READING DENOTES DIRECT

PAGE 4 OF 4

CHEM-NUCLEAR SYSTEMS, INC

VALVE PIT, FORT McCLELLAN ALABAMA



NOTE:

WATER WAS REMOVED TO FACILITATE ENTRY FOR SURVEY. THERE WAS 1/4" TO 1/2" WATER/SLUDGE REMAINING ON FLOOR. LUDLUM MODEL 19 SER# 32871 AND AN RM-14 #4041 WITH A SHIELDED PROBE WERE USED FOR THIS SURVEY. THE OTHER WALLS WERE NOT SHOWN BECAUSE OF NO SIGNIFICANT DOSE RATES OR PENETRATIONS.

J.H. Riggi 9-1-86

ENCLOSURE D.11
PAGE 1 OF 1