ROOM 128

Room 128 contained both wet and dry plutonium process glove-boxes. During production there had not only been a number of spills from these boxes but there was also a small fire in this room involving a small amount of nuclear material. After this fire the walls, floor, ceiling and all equipment in this room were painted.

After glovebox removal, this entire room was vacu-blasted and the floor coating was removed. We found approximately 2000 to 3000 dpm/100 cm^2 direct on isolated spots on the floor and ceiling support beam. Approximately 25% of the floor had reading of approximately 500 dpm/100 cm^2 direct and four spots on the walls also had approximately 500 dpm/100 cm^2 direct. A liquid process line that passed through the north block wall of this room had leaked down inside these blocks. The north wall was removed and the entire floor and hot spots on the other walls were reblasted. A number of pipe sleeves that were installed in room 128 floor had to be removed because of high gamma readings.

We used a Ludlum 2220 with a Ludlum 43-17 low energy gamma probe to identify all cracks and seams that might need decontamination. A Ludlum 2220 with a Ludlum 43-68, 43-4, or 43-27 was used with P-10 gas for all alpha release surveys. All smears were taken on Whatman smear paper and counted in a Hewwlett-Packard 5560 A (low background) automatic sample counter.

W. A. Rogers

W. A. Rogers

Pu PLANT RELEASE SURVEY PLAN

1. For initial decontamination all surfaces will be scanned with an Eberline PRM-6 with a Radeco alpha scintillation probe. Background will be maintained at less than 100 CPM(200 dpm). All areas greater than twice background will be marked and reading will be taken with a release survey instrument to document contamination levels and random large area smears will be taken.

2. After these initial areas are decontaminated, all floor surfaces and the base of each wall will be completely surveyed with a digital readout release instrument and a Ludlum large area gas proportional alpha detector and random smear samples will be taken. Release instrumentation shall have a minimum detectable level of at least 50 dpm/100 cm^2.

3. All hot spots greater than or equal to 100 dpm/100 cm^2 identified will be decontaminated.

4. A random survey with a release instrument will be taken on the walls and ceiling to try to identify any other problem areas.

5. If no problems are identified, each room will be gridded off into approximately 2 meter on a side square on the walls and floor and five readings will be taken in each grid. Readings shall be taken in the center and at the midpoint from the center to each corner.

6. Each ceiling has closely spaced rafters that will not be easily divided into 2 meter squares. Because of this, we will take readings on the bottom of each rafter at 2 meter intervals and one reading centered on the ceiling between rafters. Readings on each rafter will be staggered one meter.

7. These release readings will be documented on a map that is drawn to approximately scale measurements in meters.

8. Data provided on each map:

    1. Survey block numbers, identifiable on a scale drawings.

        a. room or area name or number.
        b. surface surveyed.
        c. type of measurement and units.

    2. Name of surveyor taking measurements, date of survey, and location.

3. Type, model number, calibration data, sensitivity limit, background, and source response of instruments used in survey.

4. When a block surveyed is below the sensitivity of the instrument, the fact that such a measurement was made should be included as significant data.

9. All release survey smears will be taken on Whatman smear paper and counted in the automatic sample counters. Each smear will cover approximately 100 cm^2.

10. There will be at least 30 survey blocks in each area to be released.

11. Piping and ductwork will be surveyed on all accessable sides at 2 meter intervals. If more than one line is running parallel in a pipe rack, readings shall be staggered at one meter intervals.

12. All readings taken that only cover part of a probe area will be corrected to dpm/100 cm^2.

13. No survey block will measure less than one meter on a side.

14. No survey block will measure more than 3 meters on a side.

15. All portable release survey instruments will be calibrated quarterly and all instruments in use will be source checked daily.

Table I-1. Acceptable surface contamination levels

Nuclides[a]	Average[b,c,f]	Maximum[b,d,f]	Removable[b,e,f]
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm^2	15,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90 Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and other noted above.	5,000 dpm βγ/100 cm^2	15,000 dpm βγ/100 cm^2	1,000 dpm βγ/100 cm^2

[a] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

[f] The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

AREA ROOM 128

Large area Probe Scan

TYPE OF SURVEY D DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68

SERIAL NUMBER 58302 & 58318

COMPLETION DATE 12-2-88

H.P. SIGNATURE K Norcom

SURVEY UNITS

AUTO. SAMPLE COUNTER #:

N
W E
S

1.5cm = 1 Meter

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 1832 / 1841 VALUE: 342 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
58302 12-2-88	107-104	2
58318 12-2 88	141-146	3

BOX 4 AREA

BEAM BEAM BEAM BEAM BEAM BEAM

SUPPORT BEAM

STAIRS

AIR DUCT

FLOOR

CEILING

AREA Room 128

Large area Probe Scan

TYPE OF SURVEY α DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-27

SERIAL NUMBER 58302 & 58318

COMPLETION DATE 12-5-1988

H.P. SIGNATURE S. Vearley - K Morcom

AUTO. SAMPLE COUNTER #:

SURVEY UNITS

N / W / E / S

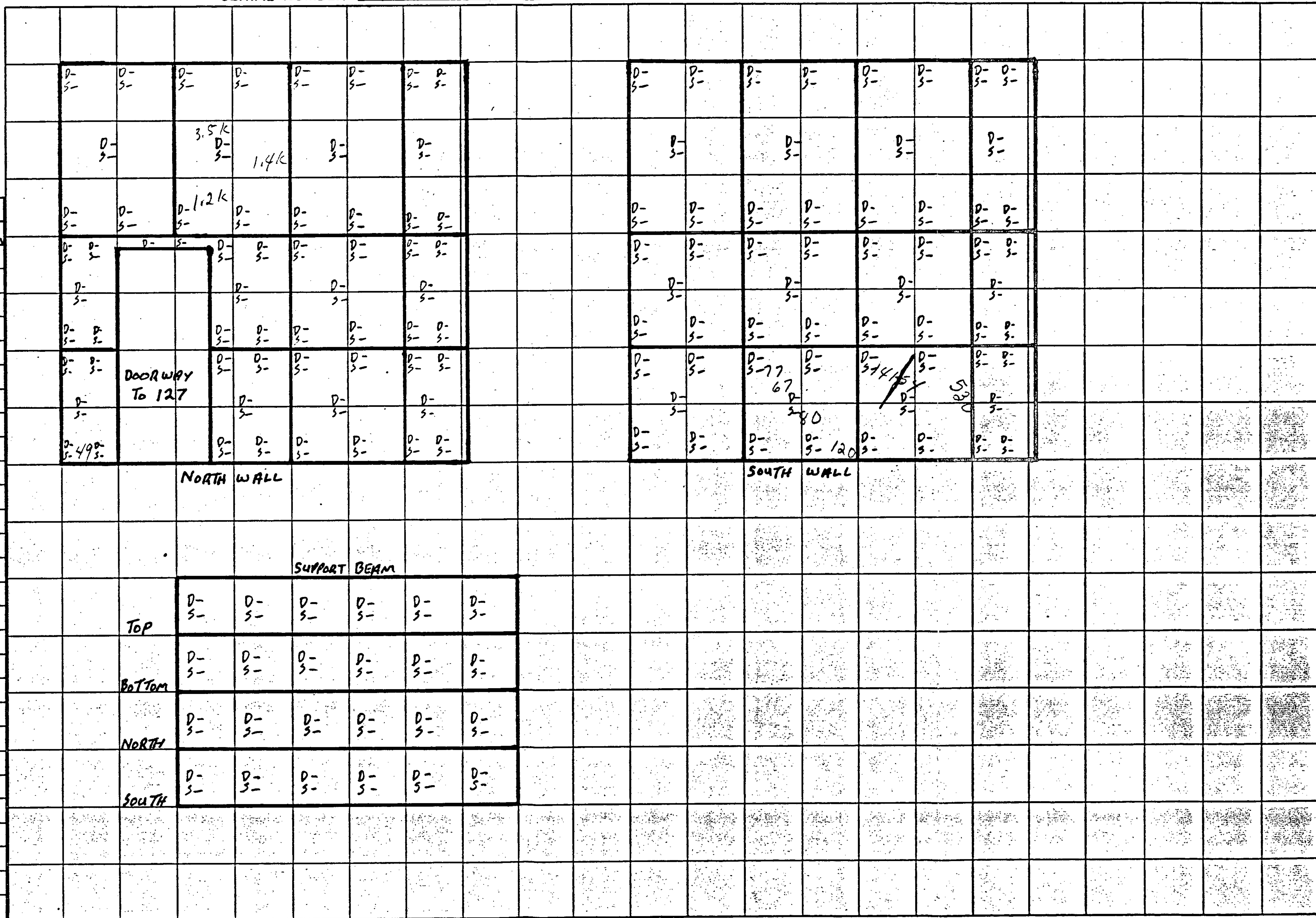
1.5cm = 1 Meter

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 1832 / 1841 VALUE: 342 / 273 DPM

	INSTRUMENT		
	DATE	SOURCE RESPONSE C/M	BKGD. C/M
58302	12-2-88	107-104	2
58318	12-2-88	141-146	3 Dm



AREA ROOM 128

TYPE OF SURVEY ∞ DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-~~68~~ 27

SERIAL NUMBER 58302 + 58318

COMPLETION DATE 12-5-88

H.P. SIGNATURE Silvestri +

SURVEY UNITS

AUTO. SAMPLE COUNTER #:

Large area Scan Probe

N
W E
S

1.5cm = 1 Meter

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D-DIRECT
S-SMEAR

SOURCE #: 1841 1832 VALUE: 273 342 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
8302 12-2-88	107-104	5 3
18318 12-2-88	141-146	3 pm

BOX 4 AREA

EAST WALL

WEST WALL

N / W — E / S

1.5cm = 1 Meter

AREA: ROOM 128 — FINAL GRID

TYPE OF SURVEY: α DIRECT + SMEAR

TYPE OF INSTRUMENT: LUDLUM 2220/DET. 43-68

SERIAL NUMBER: 37800-37807 + 50068

COMPLETION DATE: 2-24-89

H.P. SIGNATURE: W. A. Rogers

AUTO. SAMPLE COUNTER #: 1-83600115

SURVEY UNITS: DPM/100cm²

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D - DIRECT
S - SMEAR

MDA 22.17 DPM/100m² FIXED

SOURCE #: 6816 VALUE: 1078 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD. C/M
11-30-88	230-251 268-257	1 AM 1 PM
11-30-88	265-250 237-229	1 AM 2 PM
2-15-89	272-284	4 PM
2-16-89	282-268	3 AM
2-16-89	271-258	1 PM
2-17-89	265-268	2 AM
2-17-89	267-287	2 PM
2-21-89	259-282	3 AM
2-21-89	268-286	2 PM
2-22-89	267-275	1 AM
2-22-89	267-284	1 PM
	ASC. #1	
2-22-89	32	.3
2-24-89	32	.3

FLOOR

	D-24 S-9	D-20 S-3	D-64 S-3	D-56 S-6				
	D-8 S-0		D-64 S-6					
	D-32 S-3	D-80 S-6	D-56 S-0	D-52 S-3				
	D-60 S-0	D-28 S-3	D-64 S-0	D-32 S-0		Box 4 AREA		
	D-32 S-6		D-20 S-6					
37800 37807	D-20 S-0	D-12 S-6	D-24 S-3	D-8 S-0				
50068	D-4 S-0	D-16 S-6	D-20 S-3	D-16 S-0				
50068	D-24 S-0		D-20 S-3					
50068	D-24 S-3	D-28 S-0	D-12 S-6	D-12 S-3	D-32 S-0	D-4 S-6	D-12 S-3	D-16 S-0
	D-16 S-0	D-20 S-0	D-40 S-0	D-12 S-0	D-140 S-3		D-32 S-0	
50068	D-20 S-0		D-24 S-0					
50068	D-12 S-0	D-40 S-3	D-44 S-0	D-52 S-0	D-20 S-0	D-24 S-3	D-12 S-0	D-16 S-0
					D-36 S-0	D-20 S-0	D-0 S-0	D-16 S-0
	D-16 S-0	D-48 S-6	D-36 S-3	D-20 S-0	D-36 S-3		D-44 S-0	
	D-40 S-0		D-12 S-0					
	D-44 S-3	D-12 S-3	D-8 S-0	D-4 S-3	D-20 S-3	D-72 S-3	D-12 S-0	D-0 S-6
	D-20 S-3	D-36 S-0	D-12 S-0	D-32 S-0	D-4 S-3	D-0 S-0		
	D-24 S-0		D-20 S-0		D-240 S-0			
	D-20 S-0	D-24 S-9	D-24 S-0	D-20 S-0	D-4 S-0	D-4 S-0	STAIRS	
	D-8 S-6	D-32 S-6	D-28 S-0	D-24 S-9	D-8 S-0	D-16 S-0		
	D-4 S-3		D-28 S-0		D-32 S-6			
	D-20 S-0	D-12 S-0	D-20 S-0	D-4 S-0	D-36 S-0	D-40 S-6	D-48 S-3 D-4 S-0 D-40 S-3 D-4 S-6 D-16 S-3	

CEILING

BEAM		BEAM		BEAM		BEAM		BEAM		BEAM		
	D-56 S-0		D-4 S-0		D-32 S-0		D S		D S		D S	
D-8 S-0		D-24 S-0		D-8 S-0		D-4 S-0		D- S-		D- S-		
	D-12 S-0		D-44 S-0	D-0 S-3	D-0 S-0		D S		D S		D S	
D-16 S-0		D-20 S-6		D-4 S-0	D-0 S-0	D-40 S-3		D- S-		D- S-	D S	
	D-24 S-0		D	D-4 S-0	D-12 S-0		D S		D S		D S	
D-8 S-3		D-44 S-3		D-4 S-3		D-8 S-6		D- S-		D- S-		
SUPPORT BEAM												
	D-20 S-6		D-12 S-0		D-0 S-0		D-12 S-0		D-8 S-0		D S	0 3
D-24 S-0		D-24 S-0		D-0 S-6		D-4 S-0		D-8 S-0		D-20 S-0		12 0
	D-24 S-0		D-0 S-0		D-4 S-0		D-8 S-3		D-8 S-3		D S	28 3
D-0 S-0		D-4 S-3		D-8 S-0		D-0 S-0		D-8 S-3		D-8 S-3		20 0
	D-8 S-9		D-28 S-0		D-36 S-0		D-4 S-3		D-4 S-6		D S	12 0
D-0 S-0		D-8 S-0		D-8 S-0		D-0 S-0		D-4 S-6		D-8 S-0		8 0
	D-4 S-0		D-8 S-6		D-8 S-3		D-4 S-3		D-4 S-0		D S	0 3
D-8 S-3		D-12 S-0		D-0 S-0		D-12 S-0		D-40 S-6		D-4 S-0		12 0
	D-12 S-6		D-12 S-0		D-8 S-0		D-0 S-0		D-24 S-0		D S	8 0

AIR DUCT

	DIRECT	SMEAR
TOTAL DPM	3872	318
READINGS	186	186
DPM/100cm² AVG	20.82	1.72
MAX DPM/100cm²	240	9

N / W / E / S

1.5cm = 1 Meter

AREA ROOM 128 FINAL GRID

TYPE OF SURVEY D DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68

SERIAL NUMBER 37800 + 37807 + 50068

COMPLETION DATE 2-15-89

H.P. SIGNATURE W.A. Rogers

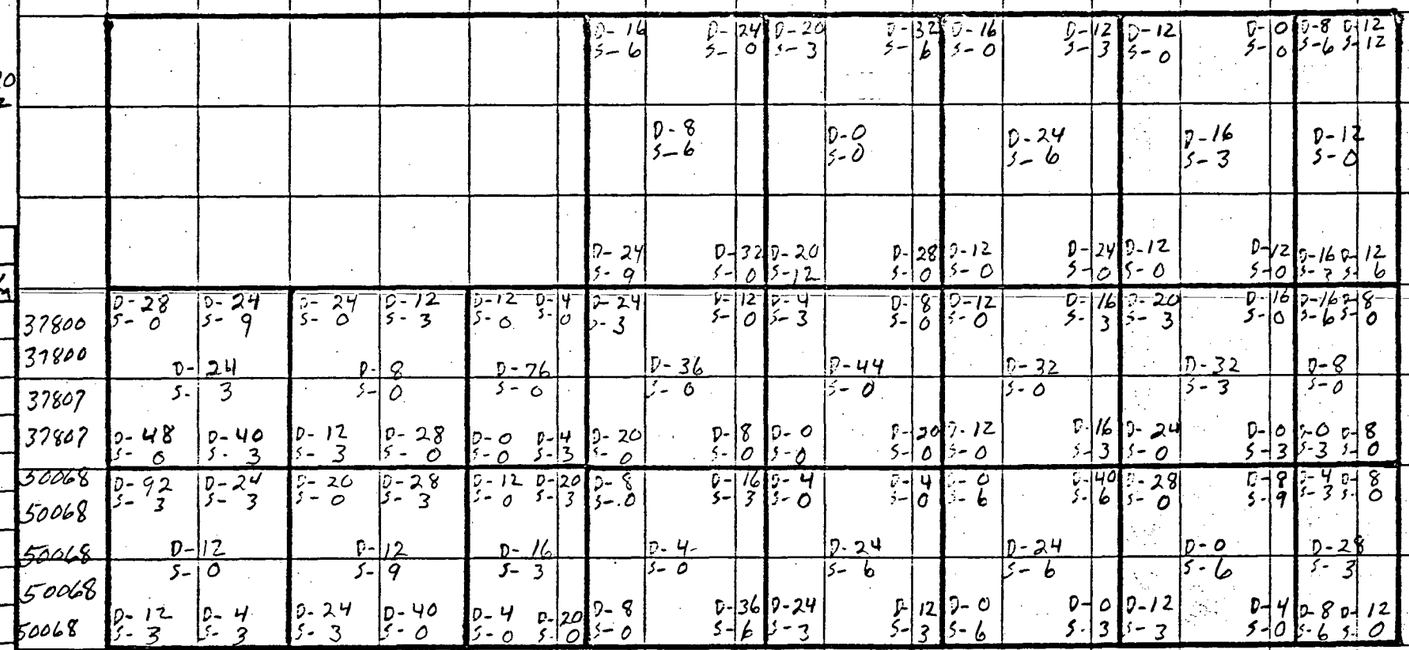
SURVEY UNITS DPM/100cm²

AUTO. SAMPLE COUNTER #: 1 SN 83600115

F – FLOOR D-DIRECT
C – CEILING S-SMEAR
N – NORTH WALL MDA 19.20
S – SOUTH WALL DPM/100cm²
E – EAST WALL FIXED
W – WEST WALL

SOURCE #: 6816 VALUE: 1078 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
11-30-89	230-251	1
11-30-89	268-257	1
11-30-89	265-250	1
11-30-89	233-239	2
2-13-89	261-278	3
2-13-89	251-241	2
2-14-89	259-268	2
2-17-89	247-270	2
3-17-89	257	
	ASC#1	
2-15-89	30	3



DIRECT

4,128 TOTAL-DPM

210 READINGS

19.66 DPM/100cm² AVG

140 MAX DPM/100cm²

SMEAR

417 TOTAL-DPM

210 SMEARS

1.99 DPM/100cm² AVG.

12 MAX DPM/100cm²

N / W — E / S

1.5cm = 1 Meter

AREA Pu-PLANT - ROOM 128

FINAL GRID

TYPE OF SURVEY α DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-68

SERIAL NUMBER 37800- 37807- 50068

COMPLETION DATE 3-21-89

H.P. SIGNATURE W. A. Rogers [illegible]

AUTO. SAMPLE COUNTER #: 1 SN 83600115

SURVEY UNITS DPM/100cm²

D - DIRECT
S - SMEAR

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

MDA 19.20 DPM/100cm² FIXED

SOURCE #: 6816 VALUE: 1074 DPM

INSTRUMENT			
DATE	SOURCE RESPONSE C/M	BKGD C/M	
11-30-89	230-257	1	37800
11-30-89	268-257	1	37800
11-30-89	265-250	0	37807
11-30-89	233-229	0	37807
12-1-89	269-266	1	37800
12-1-89	251-245	2	37800
12-1-89	242-238	2	37807
12-1-89	233-242	3	37807
12-5-89	238-236	1	37800
12-5-89	244 228	1	37800
2-13-89	261-278	3	50068
2-13-89	251-241	2	50068
2-14-89	259-268	2	50068
2-14-89	279-257	1	50068
2-15-89	274-294	3	50068
	ASC#1		
12-6-89	29	.3	
2-16-89	37	.2	
3-21-89	28	.3	

DOORWAY To 127

NORTH WALL

D- S-	D- S-	D- S-	D- S-
	D- S-	D- S-	
D- S-	D- S-	D- S-	D- S-
D-12 S-6	D-8 S-0	D-12 S-0	D-8 S-0
	D-16 S-0	D-28 S-3	
D-4 S-0	D-4 S-3	D-8 S-3	D-12 S-0
D-8 S-0	D-28 S-0	D-20 S-0	D-20 S-0
	D-16 S-0	D-16 S-3	
D-52 S-0	D-24 S-0	D-24 S-0	D-24 S-0

SOUTH WALL

D-32 S-0	D-52 S-3	D-28 S-3	D-16 S-6	D-16 S-0	D-4 S-0	D-8 S-0	D-52 S-0
	D-40 S-0		D-4 S-9		D-12 S-0	D-28 S-0	
D-16 S-0	D-4 S-0	D-16 S-0	D-4 S-3	D-12 S-0	D-16 S-0	D-8 S-6	D-16 S-0
D-16 S-0	D-28 S-3	D-44 S-0	D-24 S-3	D-12 S-3	D-8 S-0	D-16 S-3	D-20 S-0
	D-20 S-3		D-12 S-0		D-8 S-6	D-8 S-0	
D-48 S-0	D-4 S-3	D-20 S-3	D-32 S-3	D-4 S-3	D-4 S-0	D-8 S-3	D-12 S-3
D-4 S-0	D-16 S-0	D-16 S-0	D-4 S-0	D-12 S-6	D-16 S-9	D-16 S-3	D-32 S-0
	D-12 S-6		D-4 S-15		D-120 S-0	D-8 S-0	
D-12 S-3	D-16 S-3	D-8 S-9	D-0 S-0	D-24 S-3	D-16 S-3	D-16 S-0	D-52 S-3

SUPPORT BEAM

TOP	D-24 S-0	D-44 S-3	D-N/A S-3	D-44 S-6	D-20 S-9	D-12 S-15
BOTTOM	D-20 S-0	D-16 S-12	D-12 S-3	D-24 S-6	D-4 S-3	D-16 S-9
NORTH	D-56 S-3	D-24 S-12	D-36 S-3	D-28 S-0	D-12 S-6	D-8 S-3
SOUTH	D-20 S-0	D-28 S-3	D-16 S-0	D-12 S-0	D-12 S-3	D-20 S-9

DIRECT		SMEAR	
1988	TOTAL DPM	261	TOTAL DPM
103	READINGS	104	SMEARS
19.30	DPM/100cm² AVG	2.51	DPM/100cm² AVG
120	MAX DPM/100cm²	9	MAX DPM/100cm²

AREA Room 128
Top of Wall Storage Tanks

TYPE OF SURVEY δ DIRECT + SMEAR
TYPE OF INSTRUMENT Ludlum 2220 / DET. 43-68
SERIAL NUMBER 37900 - 50064

COMPLETION DATE 2-13-89
H.P. SIGNATURE W.A. Rogers
AUTO. SAMPLE COUNTER #: 1-8360115

SURVEY UNITS DPM/100cm²

N E W S

2 cm = 1 Meter

MDA 15.68 DPM/100cm² FIXED

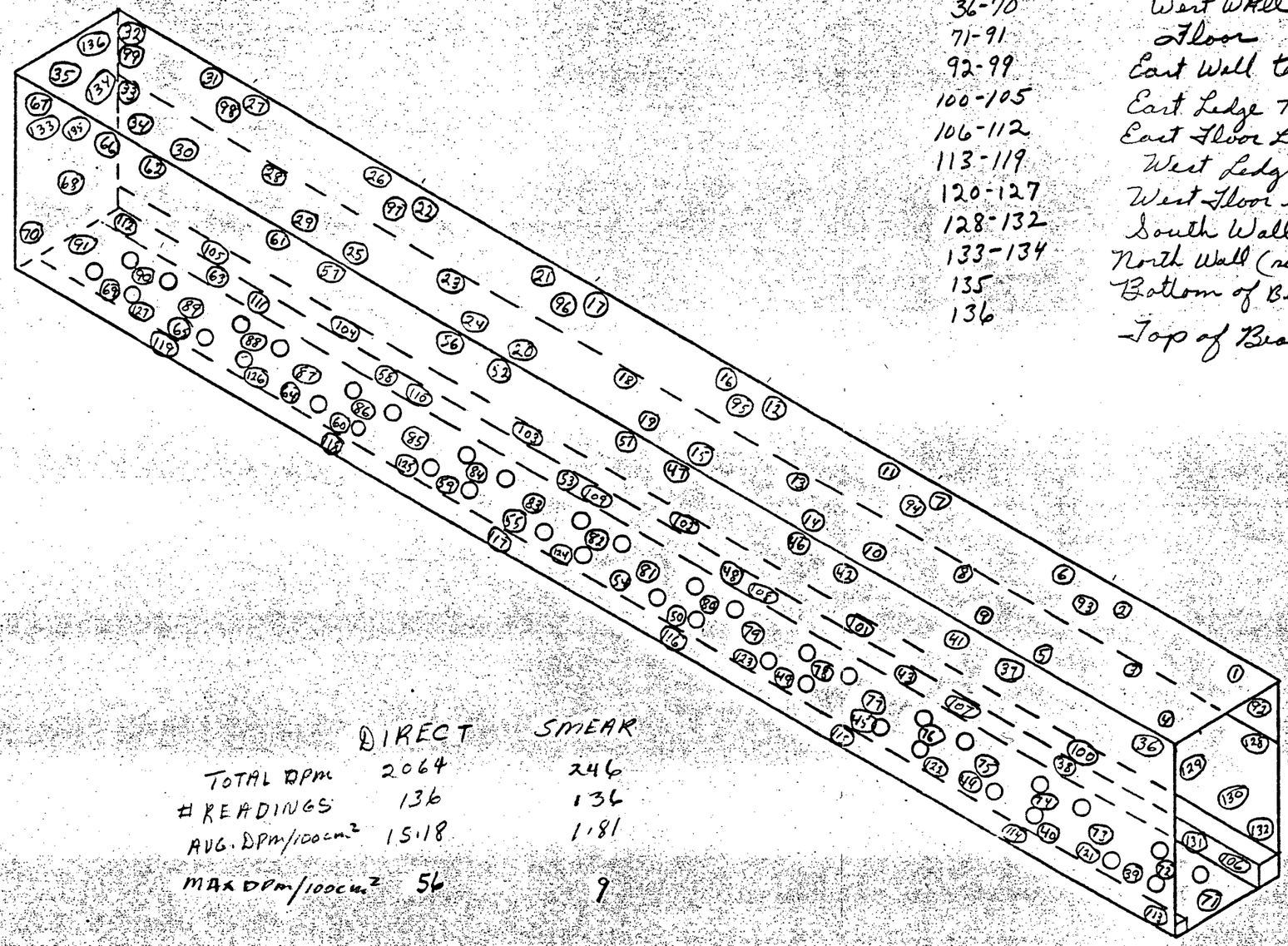
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

SOURCE #: 6816 VALUE: 1078 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
2-12-89	223-253	2
2-12-89	242-244	2
2-13-89	243-258	1
	ASC# 1	
2-14-89	34	.3

Location of Survey Points

Survey #	Location
1-35	Ceiling
36-70	West Wall
71-91	Floor
92-99	East Wall top
100-105	East Ledge Top
106-112	East Floor Lip
113-119	West Ledge
120-127	West Floor lip
128-132	South Wall
133-134	North Wall (side of Beam)
135	Bottom of Beam
136	Top of Beam



	DIRECT	SMEAR
TOTAL DPM	2064	246
# READINGS	136	136
AVG. DPM/100cm²	15.18	1.81
MAX DPM/100cm²	56	9

Room 128 top of wall storage tanks

READING IN DPM/100cm²

SURVEY #	DIRECT	SMEAR
1	16	0
2	8	3
3	12	0
4	20	0
5	8	0
6	0	3
7	8	3
8	20	0
9	4	0
10	0	0
11	16	0
12	8	0
13	12	3
14	12	0
15	8	3
16	0	3
17	0	0
18	0	0
19	0	0
20	16	0
21	8	0
22	8	0
23	16	0
24	8	3
25	16	0
26	0	0
27	0	0
28	16	3
29	0	0
30	8	3
31	16	0
32	24	0
33	0	3
34	0	0
35	16	6
36	8	3
37	0	3
38	16	3
39	24	3
40	8	3
41	0	0
42	0	0
43	16	0
44	0	6
45	0	0
46	8	0
47	24	0
48	24	0
49	8	3
50	4	3
51	4	0
52	24	0
53	12	0
54	8	3
55	12	3
56	56	3
57	20	0
58	16	6
59	4	0
60	24	0
61	24	6
62	12	3
63	36	0
64	8	0
65	24	3
66	44	0
67	24	3
68	20	0
69	24	9
70	16	3

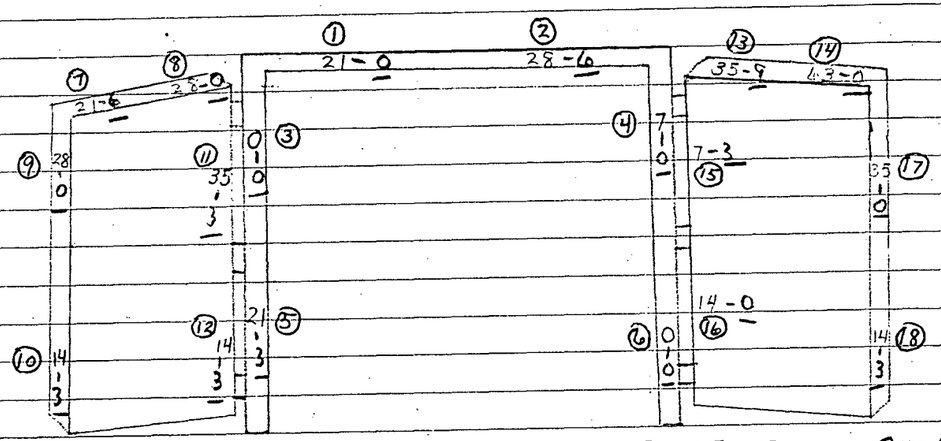
READING IN DPM/100cm²

SURVEY #	DIRECT	SMEAR
71	4	3
72	32	3
73	36	0
74	32	0
75	20	0
76	24	9
77	28	0
78	8	3
79	8	0
80	20	0
81	24	0
82	36	0
83	16	0
84	20	0
85	56	3
86	8	0
87	12	0
88	16	0
89	16	0
90	4	3
91	4	0
92	4	0
93	32	0
94	28	3
95	16	0
96	16	3
97	0	9
98	12	6
99	8	3
100	12	6
101	32	6
102	24	3
103	40	3
104	24	3
105	8	6
106	4	0
107	28	0
108	8	3
109	16	3
110	28	0
111	16	0
112	4	0
113	20	3
114	20	3
115	20	3
116	20	6
117	12	0
118	48	6
119	20	0
120	20	6
121	8	3
122	24	9
123	8	3
124	16	6
125	20	0
126	12	3
127	16	3
128	32	0
129	0	3
130	28	3
131	8	0
132	12	0
133	20	0
134	12	0
135	12	0
136	332 → recount 16	0 Reviewed 3-6-85 WCH

RM 128 7-5-89

LUDLUM 2220
#58318, 43-4
SOURCE #6868, 1655 dpm
SOURCE CK., 260-263, BKG- 3(AM)
256-263, BKG- 2(PM)
ILP.

DOORS

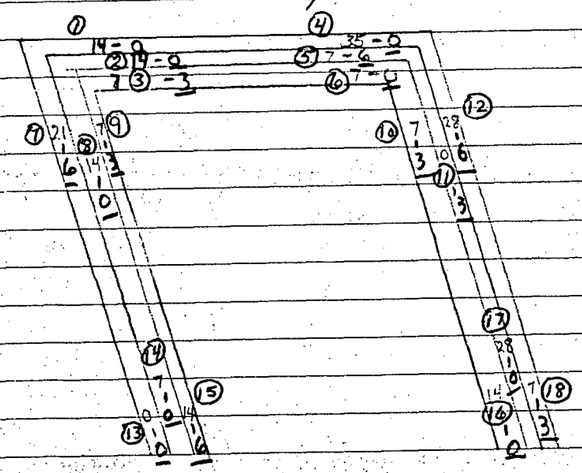


	DIRECT	SMEAR
TOTAL DPM	616	78
READINGS	36	63
DPM/100cm² AVG	17.11	2.17
MAX DPM/100cm²	63	9

IDENFICATION # CIRCLED
SMEARS UNDER LINED
IN RED

MDA 33,61
DPM/100cm²
FIXED

FRAME



PLANT PU AREA Room 128 Door
SURVEYED BY I POWELL
INST. LUDLUM 2220 * # 58318 DET. 43-4
SOURCE CK 260-263 / 256-263 BKG. 3-2
DATE: 7-5-89 SOURCE #: 6868 VALUE: 1065 DPM

ASC # 2 83600108
CTD. BY Jm Black
SOURCE CK AVG. 31
BKG. .3
DATE: 7-7-89

READINGS IN DPM/100 cm²

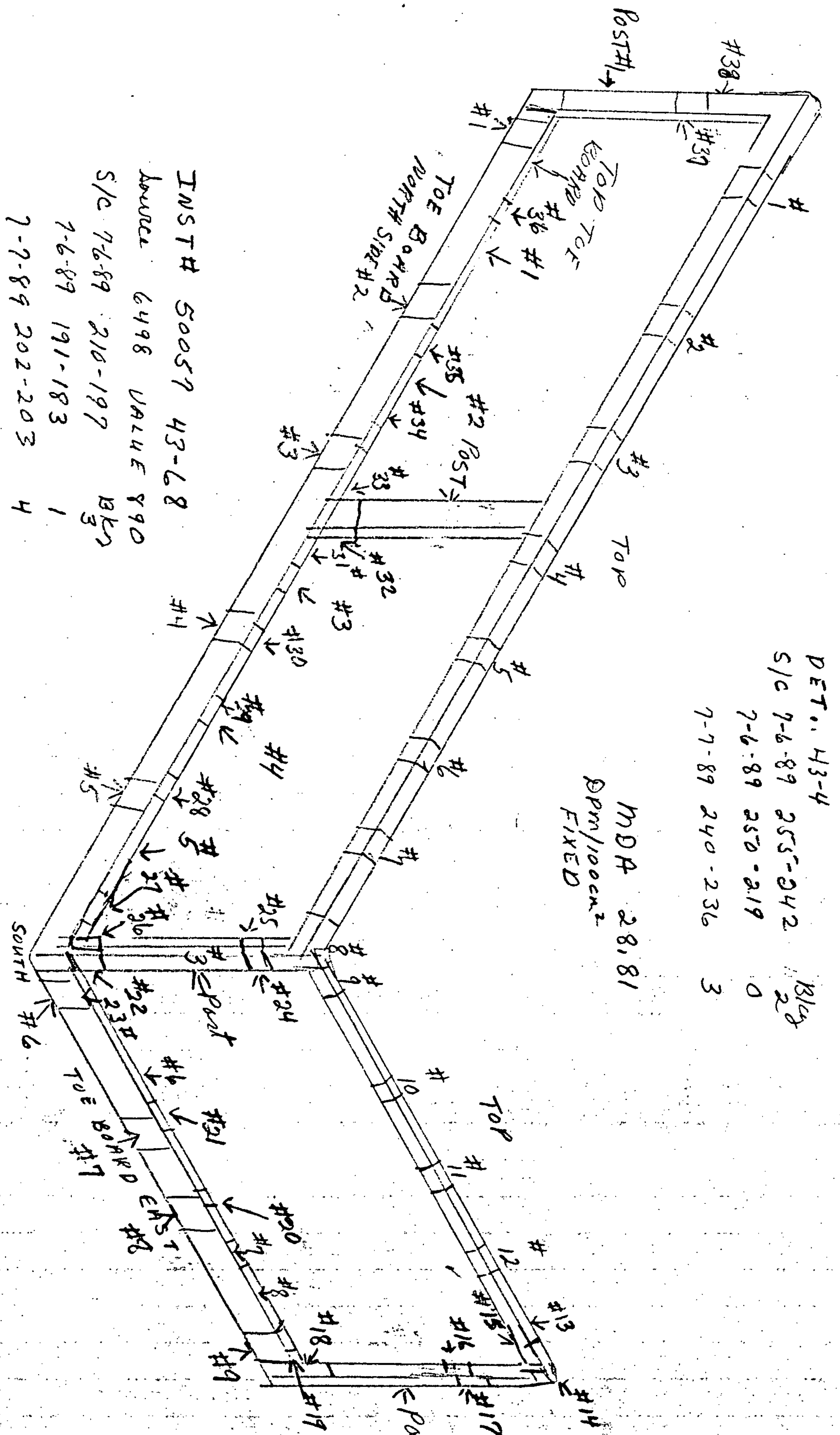
SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
Room 128 DOORS	1	3	21	0
	2	4	28	6
	3	0	0	0
	4	1	7	0
	5	3	21	3
	6	0	0	0
	7	3	21	6
	8	4	28	0
	9	4	28	0
	10	2	14	3
	11	5	35	3
	12	2	14	3
	13	5	35	9
	14	9	63	0
	15	1	7	3
	16	2	14	0
	17	5	35	0
	18	2	14	3

PLANT PU AREA Room 128 Door
SURVEYED BY I POWELL
INST. LUDLUM 2220 * # 58318 DET. 43-4
SOURCE CK 260-263 / 256-263 BKG. 3-2
DATE: 7-5-89 SOURCE #: VALUE: DPM

ASC # 2-83600108
CTD. BY Jm Black
SOURCE CK. AVG. 31
BKG. .3
DATE: 7-7-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
Room 128 DOOR FRAME	1	2	14	0
	2	2	14	0
	3	1	7	3
	4	5	35	0
	5	1	7	6
	6	1	7	0
	7	3	21	6
	8	2	14	0
	9	1	7	3
	10	1	7	3
	11	0	0	3
	12	4	28	6
	13	0	0	0
	14	1	7	0
	15	2	14	6
	16	2	14	0
	17	4	28	0
	18	1	7	3



DIRECT SMEAR
TOTAL DPM 4,298 111
READINGS 104 68
DPM/100cm² AVG 41.33 1.63
Max DPM/100cm² 96 9

INST# 50057 43-68
Source 6498 VALUE 890
S/C 7-6-89 210-197 Bkg 3
7-6-89 191-183 1
7-7-89 202-203 4

Room 128 Guard Rail
Around Box 4 Area
INST # 58309 SOURCE 6498 VALUE 890
DET. 43-4
S/C 7-6-89 255-242 Bkg 2
7-6-89 250-219 0
7-7-89 240-236 3

MDA 28.81
DPM/100cm²
FIXED

PLANT PH AREA Room 128 Guard Rail around Box 4 area
SURVEYED BY Ainley H
INST. LUDLUM 2220 # 58309 DET. 43-4 / 43-68
SOURCE CK 255-242 / 210-197 BKG. 50057 2-3
DATE: 7-6-89 7-7-89 Source #: 6498 VALUE: 890 DPM

ASC # 2-83600108
CTD. BY [illegible]
SOURCE CK. AVG. 31
BKG. 12
DATE: 7-10-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
#1 TOP NORTH	HT	6	36	6
	HB	9	54	
	HE	16	96	0
	HW	5	30	
#2 TOP	HT	6	36	0
	HB	12	72	
	HE	3	18	0
	HW	3	18	
#3 TOP	HT	3	18	0
	HB	7	42	
	HE	13	78	0
	HW	8	48	
#4 TOP	HT	4	24	9
	HB	15	90	
	HE	6	36	0
	HW	2	12	
#5 TOP	HT	16	96	0
	HB	12	72	
	HE	7	42	0
	HW	0	0	
#6 TOP	HT		84	0
	HB		60	
	HE		24	0
	HW		60	
#7 TOP	HT		30	0
	HB		48	
	HE		30	0
	HW		54	

PLANT PU AREA Room 128 Hood
SURVEYED BY ANDY Rail around Bot 4 area
INST. LUDLUM 2220 * # 58309 DET. 43-4
SOURCE CK 255-242 210-197 BKG. 2-3 50057 43-68
DATE: 7-6-89 7-7-89 SOURCE #: 6498 VALUE: 890 DPM

ASC # 2-83600108
CTD. BY J M Black
SOURCE CK. AVG. 31
BKG. .2
DATE: 7-10-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
TOP #8 North TOP	HT		84	6
	HB		90	
	HE		72	3
	HW		36	
TOP #9 South	HT		60	6
	HB		48	
	HN		30	0
	HS		18	
TOP #10	HT		6	3
	HB		54	
	HN		6	0
	HS		18	
TOP #11	HT		36	0
	HB		90	
	HN		6	0
	HS		30	
TOP #12	HT		12	0
	HB		54	
	HN		12	0
	HS		24	
#13 TOP	HN		60	0
#14 TOP END	HT		36	0
	HB		84	
#15 TOP SIDE	HS		30	3
#16 East TOP Vertical Post #4	VN		48	3
	VS		78	

PLANT PU AREA Room 128 Hood
SURVEYED BY Andy Rails around Bot 4 area
INST. LUDLUM 2220 * # 58309 DET. 43-4
SOURCE CK 255-242 210-197 BKG. 2-3 50057 43-68
DATE: 7-6-89 7-7-89 SOURCE #: 6498 VALUE: 890 DPM

ASC # 2-83600108
CTD. BY J M Black
SOURCE CK. AVG. 31
BKG. .2
DATE: 7-10-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
#17 EAST TOP Vertical Post #4	VE		36	0
	VW		60	
#18 EAST Bottom Vertical Post #4	VN		42	3
	VS		72	
#19 TOP EAST TOE Board	HT		0	0
#20 EAST TOE Board TOP	HT		42	0
#21 EAST Toe Board TOP	HT		48	0
#22 Bottom Post #3	VE		96	3
	VW		12	
#23 TOP Toe Board	HT		78	3
#24 TOP Post #3	VE		78	3
	VW		36	
#25 TOP Post #3	VN	5	30	0
	VS		78	
#26 Bottom Post #3 North side	VN		36	0
	VS		72	
#27 TOP Toe Board North	HT		72	3
#28 TOP Toe Board North	HT		78	3
#29 TOP Toe Board North	HT		96	6
#30 Top Toe Board North	HT		42	3

PLANT PU AREA Room 129 Hood
SURVEYED BY Andy H Rail around area Box 4
INST. LUDLUM 2220 * 58309 DET. 43-4 43-68
SOURCE CK 210-197 255-242 BKG. 2-3 50057
DATE: 7-6-89 7-7-89 SOURCE #: 649 VALUE: 890 DPM

ASC # 2-83600108
CTD. BY Jim Black
SOURCE CK AVG. 31
BKG. 2
DATE: 7-10-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
#31 Top Toe Board North	HT		24	0
#32 Bottom #2 Post North	VW		30	3
	VS		18	
#33 Bottom #2 Post North	VE		12	0
	VW		72	
#34 Top Toe Board North	HT		42	0
#35 Top Toe Board North	HT		36	3
#36 Top Toe Board North	HT		12	0
#37 Top North Post #1	VE		18	6
	VW		48	
#38 Top North Post #1	VW		42	3
	VS		42	
Toe Board Side Bottom #1-10				
#1	OF		12	0
#2	OF		0	0
#3	OF		24	3
#4	OF		40	0
#5	OF		16	0
#6	OF		12	3
#7	OF		4	0
#8	OF		24	0
#9	HT		36	0
#10	OF		32	0
#1 TOE Board TOP 1-8	IF		12	0
#2	IF		24	9
#3	IF		20	3
#4	IF		48	3

PLANT PU AREA Room 129 Hood
SURVEYED BY Andy H Rail around area Box 4
INST. LUDLUM 2220 * 58309 DET. 43-4 43-68
SOURCE CK 210-197 255-242 BKG. 2-3 50057
DATE: 7-6-89 7-7-89 SOURCE #: 649 VALUE: 890 DPM

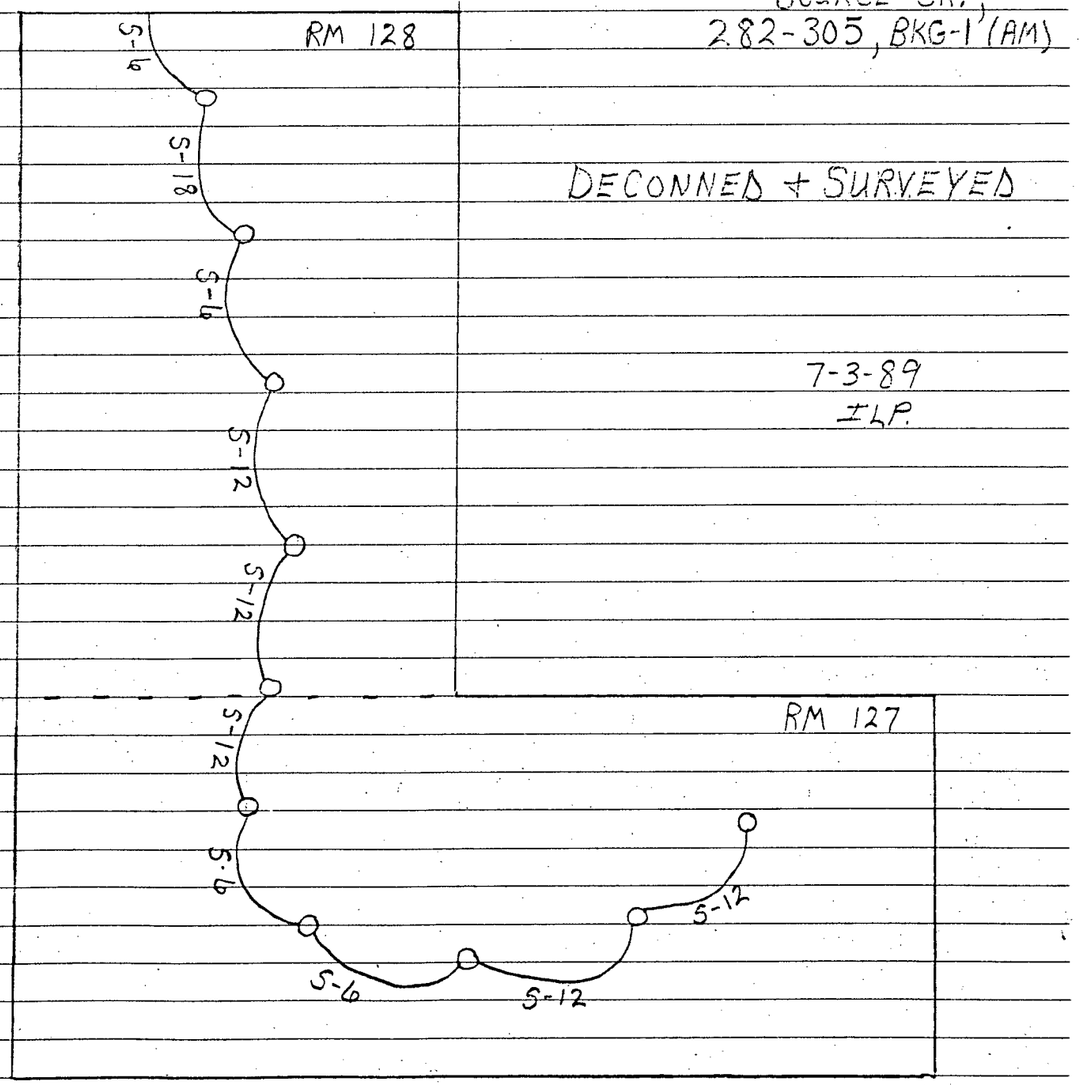
ASC # 2-83600108
CTD. BY Jim Black
SOURCE CK AVG. 31
BKG. 2
DATE: 7-10-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
#1-8 TOP OF TOE Board				
#5	IF		20	0
#6	IF		24	0
#7	IF		24	6
#8	IF		56	3

SMEARS ON CABLE TO LIGHTS

LUDLUM 2220
#50064, 43-4
SOURCE # 6816
1078 dpm
SOURCE CK.;
282-305, BKG-1 (AM)



DECONNED + SURVEYED

7-3-89
ILP

PLANT PU AREA RM 128
SURVEYED BY ILP
INST. LUDLUM 2220 # 50064 DET. 2/3-4
SOURCE CK 282-305 BKG. 1 (PM)
DATE: 6-30-89 SOURCE # 6816 VALUE: 1078 dpm

ASC # 1-83600115
CTD. BY Ann Black
SOURCE CK. AVG. 31
BKG. 2
DATE: 7-3-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
LIGHT FIXTURES			
①			
OUT	2	12	0
IN	0	0	3
②			
OUT	2	12	3
IN	3	18	0
③			
OUT	3	18	168 - 0 *
IN	3	18	3 - 0
④			
OUT	2	12	0
IN	3	18	0
⑤			
OUT	3	18	3
IN	1	6	0
After Decon			
③			
OUT	3	18	0
IN	3	18	0
	Direct		Smear
Total DPM/100cm² AVG	168		111
Readings	12		22
DPM/100cm² AVG	14.0		505
Max DPM/100cm²	18		18

MDA 16.63
DPM/100cm²
FIXED

RM 128 PIPE SURVEY PAGE 1 OF 1

LINE NUMBER 567 DATE 6-30-89

INSTRUMENT LUDLUM 2220 SERIAL NUMBER #50064

DETECTOR 43-4 OPERATOR ILP

SOURCE NUMBER AND VALUE #6816, 1078 dpm

SOURCE RESPONSE AND BACKGROUND AM

SOURCE RESPONSE AND BACKGROUND PM 282-305, 1 (PM)

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
SOUTH WALL	M. STEEL	2 IN	0 METERS			
			E	5	60	3
			W	4	48	0
			2 METERS			
			E	4	48	0
			W	4	48	6
			3 METERS			
			E	6	72	3
TO SOUTH			W	5	60	3
WALL FLOOR						

	Direct	Smear
Total DPM	336	15
Readings	6	6
DPM/100cm² AVG	56.0	2.5
Max DPM/100cm²	72	6

MDA 33.26
DPM/100cm²
FIXED