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For the U. S. Energy Research and Development Administration

J. M. Ruff

Division of Classification

MOUND LABORATORY

Operated By

MONSANTO CHEMICAL COMPANY

MIAMISBURG, OHIO

HEALTH PHYSICS MONTHLY INFORMATION REPORT

This document is PUBLICLY RELEASABLE

Hugh Kinser

Authorizing Official

Date: 3/16/09

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MASTER

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Date: April 1-30, 1953

Prepared By: J. E. Bradley
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GENERAL

One member of the section spent the month of April in Mercury, Nevada participating in Program 27 of the current test series.

One member of the section attended the Industrial Health Conference in Los Angeles. This included the Atomic Energy Commission Meeting on Industrial Health.

SURVEY GROUPS

Statistics

Air monitoring samples (polonium)	4 908
Air monitoring samples (other)	1,856
Wipe samples	27,035
Routine and special surveys	1,093

Laboratories - "T" Area

Several minor incidents, causing localized contamination only, occurred in various areas as follows:

Micro-Assay Labs

April 3 - Foil lost on floor in room 260. Foil was later recovered.

April 16 - Numerous gauntlet changes were required. Reason for contamination was not known. Air borne contamination increased because of these frequent changes.

Process and Electrolysis Labs

April 6 - Pierced gauntlets in labs 267 and 270 caused high air counts due to the glove leakage. Floors in both labs were contaminated.

April 8 - Contaminated glass on the hood panels of first five hoods of Line 1 caused high air sample counts.

Inventory and Control

April 9 and 10 - High air counts in lab attributed to removal of old floor tiling and resetting of new tile.

Counting Room 317

April 13 - Sample dropped on floor. Localized contamination in excess of 28,000 d/m.

In general, the levels of contamination were up slightly in all areas. Although there were no major spills, spot contamination was an almost daily occurrence. Principal cause of contamination both surface and air borne, was defective gauntlets. Contamination was confined mostly to the upper laboratory surfaces. Operations and Health Physics personnel are currently investigating these difficulties in an effort to determine necessary corrective measures.

No survey or decontamination work has been done in the "A" Influent Tank at the "WD" Building since the first of the month. The sandblasting has been completed, and the tank is now being painted.

There were 20,056 wipe samples collected from the "T" Area laboratories, with 2.5 percent of the results exceeding 500 d/min/40 in.^{2}

Laboratories - "G" Area

The modification of rooms 123, 124, and 125 in the "R" Building was completed as scheduled. Personnel were allowed to enter the high risk areas on April 9 to start cleaning of the general high risk area. In the first two days of this work, all equipment located in room 118 or corridor 5 was moved into the side corridors which were then sealed off from the central corridor. R-118 is to be converted into an air lock and used to facilitate removal of contaminated equipment.

Several efforts have been made to decontaminate these two areas. The walls were washed with a solution of Sterox, Santomerse, and citric acid. Second washings were with an NaOH solution. The floors were scrubbed with similar solutions plus HCl. Levels of contamination were reduced considerably but are not yet completely satisfactory, as may be seen from the data in the following table.

LOCATION	NO. OF CLEANINGS	RANGE OF READINGS (*Alpha in d/min/10cm^2*)	RANGE OF WIPES (*Alpha in d/min/40in.^{2}*)
FLOOR-CORRIDOR 5	3	1,000 - 100,000	100 2,500
WALLS-CORRIDOR 5	3	600 - 8,000	30 - 5,000
FLOOR-R-118	6	1,000 - 20,000	100 - 7,500
WALLS R-118	6	0 2,500	86 - 7,200

It is felt that cleaning measures will do little to reduce the remaining contamination, and that actual physical removal of surfaces may be required.

The cleaning and modification of the 1A area preparatory to the general clean-up program for the actinium areas of the "GP" Building is still in progress. The low risk air lock, high risk air lock, and the decontamination room have been scrubbed down and contamination reduced to satisfactory levels. All equipment has been removed and a part of the reconstruction has been completed.

Friday, April 10, the west stack fan was shut down at 4:30 p.m. This fan remained inoperative during the next 24½ hours to permit repairs on the vanes. Three 100 cf samples of air were taken in the "R" Building corridors on Saturday. The levels of air borne contamination as determined by an alpha meter assay of the filter indicated a considerable increase over the normal background levels. Although wipe samples in these same areas showed no particulate floor contamination, all traffic was halted. Monday morning, the air levels were again assayed and found to have returned to normal, so all areas were redpened to traffic

A summary of the results of wipe samples collected from the "G" Area polonium laboratories follows:

"R" Building - 3,312 wipe samples taken with 0.2 per cent greater than 500 d/min/40 in.^{2}

"B" Building - 2,932 wipe samples taken with 0.3 per cent greater than 500 d/min/40 in.^{2}

"H" Building - 735 wipe samples taken with 7.3 per cent greater than 500 d/min/40 in.^{2}

AIR SAMPLING

The following table summarizes the results of air samples collected and analyzed for polonium during April.

SAMPLING LOCATION		NO. OF SAMPLES	PER CENT ABOVE 1,000 D/MIN/M^3	AVERAGE D/MIN/M^3
"T" BLDG.	- CLEAN	103	0	35
	LOW RISK	1,219	1.1	860
	HIGH RISK	567	36.3	19,343
	EXHAUST SYSTEMS	186	0	29
"R" BLDG.	- LOW RISK	890	0.1	13
	HIGH RISK	44	0	10
	EXHAUST SYSTEMS	220	0	7
"B" BLDG.	- LOW RISK	857	0.1	21
	HIGH RISK	88	0	30
	EXHAUST SYSTEMS	132	0	3
"H" BLDG.	- CLEAN LAUNDRY	110	0	20
	HOT LAUNDRY	88	0	30
	EXHAUST SYSTEMS	44	0	10
"WD" BLDG.	- LOW RISK	189	0	57
"HH" BLDG.	- HIGH RISK	147	8.1	570
OTHER		46	0	15

MAXIMUM PERMISSIBLE CONCENTRATION - 1,000 D/MIN/M^3

A large number of samples were collected in the radium-actinium areas. These samples were given an alpha count immediately after collection. Recounts taken at intervals indicated

that a large portion of the activity present on the samples consisted of daughter products of the radon isotopes.

The following table gives the results of these samples based upon initial count and corrected for decay loss during sampling and counting time.

LOCATION	CLASSIFICATION	NO. OF SAMPLES	MAXIMUM*	AVERAGE*
R-109	LOW RISK	44	6.5	2.4
R-120	LOW RISK	44	48.3	3.7
R-122	LOW RISK	44	6.1	4.2
R-123	LOW RISK	44	14.7	9.2
R-125(A)	LOW RISK	43	23.1	9.7
R-127	LOW RISK	44	7.7	3.7
R-129	LOW RISK	43	37.6	19.4
R-130	LOW RISK	42	2.7	1.4
R-133	LOW RISK	44	4.8	2.9
R-137	LOW RISK	39	9.5	5.4
R-145	LOW RISK	43	2.4	1.2
R-147	LOW RISK	44	7.5	3.7
R-152	LOW RISK	44	18.5	5.5
R 159	LOW RISK	44	5.6	2.9
R-161	LOW RISK	44	35.0	8.2
R-168	LOW RISK	44	41.0	27.3
R-171	LOW RISK	44	3.9	2.3
R-CRAWL SPACE	LOW RISK	44	6.7	2.1
R-CORRIDOR 117	LOW RISK	44	7.2	2.3
R-CORRIDOR 140	LOW RISK	44	8.4	4.9
R-CORRIDOR 159	LOW RISK	44	4.0	3.0
R-118	HIGH RISK	4	350.0	304.6
R-119	HIGH RISK	18	5,920.2	2,251.3
R-121	HIGH RISK	21	1,774.3	1,258.4
R-125(B)	HIGH RISK	43	475.3	69.1

LOCATION	CLASSIFICATION	NO. OF SAMPLES	MAXIMUM*	AVERAGE*
R-128	HIGH RISK	22	1,400.3	775.7
H-135	LOW RISK	22	8.7	3.7
R-132	HIGH RISK	22	11,778.0	1,446.4
R-135	HIGH RISK	22	1,545.9	1,091.9
R-141	HIGH RISK	22	963.3	392.2
R-143	HIGH RISK	22	2,279.7	872.1
R-144	HIGH RISK	22	22,713.6	7,377.8
R-146	HIGH RISK	21	29,640.0	3,089.2
R-148	HIGH RISK	22	687.8	383.4
R-150	HIGH RISK	22	1,464.8	599.9
R-CORRIDOR S	HIGH RISK	43	972.7	504.2
R-CORRIDOR N	HIGH RISK	44	2,497.6	894.4
GP-1A #1	LOW RISK	44	25.4	4.9
GP-1A #4	LOW RISK	44	19.4	9.3
GP-1A #6	LOW RISK	50	14.6	6.2
GP-1A #10	LOW RISK	48	90.3	11.1
GP-1B #1	LOW RISK	46	10.8	5.1
GP-1B #2	LOW RISK	46	15.3	6.5
GP-1A #3	HIGH RISK	44	3,996.7	2,249.9
GP-1A #5	HIGH RISK	19	24,654.2	10,517.6
GP-1A #8	HIGH RISK	19	17,055.9	10,642.0
GP-1A #11	HIGH RISK	54	384.2	103.4
GP-1A #12	HIGH RISK	32	187.1	54.8
GP-1B #3	LOW RISK	45	11.3	5.0
GP-BREEZEWAY	LOW RISK	10	41.7	19.4
GP-JANITOR ROOM	LOW RISK	4	119.4	80.4
GP-MAINT. EQUIP. ROOM	LOW RISK	1	3.0	3.0
B-102	LOW RISK	22	4.2	2.2
B-108	LOW RISK	22	4.1	1.8

*MULTIPLY ALL RESULTS BY 10^{-10} TO OBTAIN μC/CC

Samples of the type reported above are recounted at intervals for a period of 20-30 days. Information from these counts makes it possible to estimate the concentration of long-lived material in the air. These results, of course, come too late to assist materially in preventing exposure. For this reason, if the initial counts are significant, personnel are required to wear respiratory protection.

Following is a summary of such an analysis of samples collected in March.

LOCATION	AREA CLASSIFICATION	NO. OF SAMPLING DAYS	MAXIMUM*	AVERAGE*
GP-1B	LOW RISK	21	3.1	0.15
GP-1A	LOW RISK	21	1.3	0.13
GP-AIRLOCK	LOW RISK	21	4.1	0.33
GP-1AB NORTH	HIGH RISK	10	1.0	0.42
GP-1AB SOUTH	HIGH RISK	13	0.4	0.21
GP-AIR LOCK	HIGH RISK	12	0.5	0.24
GP-DECONTAMINATION	HIGH RISK	22	2.5	0.27
GP-EXHAUST DUCTS	HIGH RISK	22	1.4	0.35
GP-EXHAUST	TO STACK	19	1.8	0.42
R-109	LOW RISK	21	1.2	0.15
R-CORRIDORS	LOW RISK	20	0.03	0.02
R-120	LOW RISK	20	0.03	0.01
R-123	LOW RISK	21	0.9	0.27
R-129	LOW RISK	20	0.003	0.003
R-130	LOW RISK	20	0.03	0.02
R-137	LOW RISK	20	0.2	0.11
R-145	LOW RISK	20	0.01	0.006
R-147	LOW RISK	20	0.02	0.01
R-159	LOW RISK	25	0.02	0.01
R-161	LOW RISK	25	0.1	0.06
R-118	LOW RISK	25	0.1	0.04
R-215	LOW RISK	25	0.06	0.01
R-CORRIDOR SOUTH	HIGH RISK	20	0.03	0.02
R-119	HIGH RISK	8	1.5	0.64

LOCATION	AREA CLASSIFICATION	NO. OF SAMPLING DAYS	MAXIMUM*	AVERAGE*
R-121	HIGH RISK	21	0.5	0.15
R-128	HIGH RISK	21	1.1	0.24
R 135	HIGH RISK	21	2.4	0.52
R-141	HIGH RISK	21	0.5	0.21
R CORRIDOR NORTH	HIGH RISK	25	0.06	0.05
R-143	HIGH RISK	21	3.4	1.0
R-144	HIGH RISK	20	0.3	0.15
R-146	HIGH RISK	21	1.0	0.18
R 148	HIGH RISK	20	0.6	0.24
R 150	HIGH RISK	17	1,374.6	95.5**
R-160	HIGH RISK	22	67.5	31.8

*MULTIPLY ALL VALUES BY 10^{-12} TO OBTAIN μC/CC.

**LONG-LIVED CONTENT IDENTIFIED AS POLONIUM.

PERSONNEL MONITORING

Bioassay

Nine hundred thirty-five urine samples were analyzed for polonium content during the month of April. Control samples during this period totalled 45. Operating area personnel contributed 662 specimens; the remaining 273 specimens were submitted by non-operating area personnel. Two specimens, from one employee, were in excess of 24 d/min/50 ml. One employee who had been removed from his regular work because of high urine counts, has been permitted to return to his usual working area. His recent urinalyses indicate a sufficiently low body content.

Twenty-four polonium spiked samples were processed for an extraction efficienty test. These tests are made on a routine basis. The average extraction efficiency for this month was 85 per cent.

Fifty-nine routine "24-hour" urine specimens and five feces samples were analyzed for actinium and radium content. The body burden of the employees sampled is determined by the differential decay method of analysis of the specimen mounts. The results of this accelerated program for these elements are not significantly different from the previous two months.

Pocket Chambers

Total number read 11,499

Number of single readings	
(30-100 mr)	75
(100-200 mr)	5
(over 200 mr)	5
Number of paired readings	
(30-100 mr)	6
(100-200 mr)	0
(over 200 mr)	0

Film Meters

Regular

Total number processed	886
Number of readings	
(50-150 mrep)	21
(150-300 mrep)	5
(300-600 mrep)	2
(over 600 mrep)	0

Visitors

Total number processed	1,351
Number of readings	
(50-150 mrep)	3
(150-300 mrep)	1
(over 300 mrep)	0

Neutron Films

Total number processed	118
Number of readings	
(0-100 mrem)	118
(100-300 mrem)	0
(over 300 mrem)	0

SITE SURVEYS

Twenty-nine off-area air samples were collected downwind from Mound Laboratory. The highest count recorded was 11 d/min/m^3 of air. This sample was taken at Hopkinsville, Ohio,

on March 20, 1953. Sixty-five per cent of all samples registered a zero count. Results of mud, water, and vegetation samples during the month are as follows:

SAMPLES	NO. COLLECTED	MAXIMUM VALUE	AVERAGE VALUE
WATER	38	5.31×10^{-6} μc/cc	5.22×10^{-7} μc/cc
MUD	20	1.02×10^{-3} μc/GM	1.16×10^{-4} μc/GM
VEGETATION	18	1.62×10^{-6} μc/GM	9.0×10^{-8} μc/GM

The maximum water sample was collected on April 6, 1953 at location where the plant effluent enters the Miami River. The maximum mud sample was collected on April 20, 1953, 850 paces downstream from the location where the plant effluent enters the Miami River. The maximum vegetation sample was collected at Gurneyville, Ohio on April 13, 1953.

PERSONNEL DISTRIBUTION

Personnel

Section Chief	1
Supervisors	4
Ass't. Health Physicists	3
Chemists	2
Health Surveyors	12
Laboratory Assistants	7
Custodial Supervisor	1
Custodian	1
Decontamination Workers	32
Clerk-Typist	1
Total	64

Allocation of Time in Man-Months

Bioassay	4¼
Pocket Meters	2¼
Film Meters	2¼
Mud, water and vegetation	1¼
Surveys - "T" Area	6
Surveys - "G" Area	8
Laundry monitoring	2
Custodial and Decontamination	
"T" Area	21½
"G" Area	13½
Administrative	2
Las Vegas tests	1
Total	64