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OFFICE MEMORANDUM

TO : Tom Keenan, Group 8 Waste Management Section Leader

DATE: February 27, 1975

THRU : R. D. Baker, CMB-Division Leader

FROM : G. R. Waterbury & Al Zerwekh

SUBJECT: TRANSURANIC WASTE & DEVELOPMENT PROGRAM (A412) MONTHLY REPORT FOR FEBRUARY 1975

SYMBOL : CMB-1

1505 Report

1. Corrosion studies of coated mild steel samples from waste drums are being continued in 50 and 100% relative humidity in air. The search for non-metallic substitutes for packaging wastes also continues, with emphasis on fibre drums. A fire test was conducted on a fibre drum coated on the outside with fire retardant paint. The drum was filled with hydrogenous waste, placed in the center of a simulated storage array of fibre drums, and a nichrome element inside the drum was kept at 800°C for 70 min without igniting the drum. The hydrogeneous waste near the heating element charred but did not burn until removed from the drum and exposed to air. Gas samples were withdrawn from the drum before the test and at 1, 5, and 10 min during the test; these samples are being analyzed mass spectrographically.

2. Radiolysis studies were continued by measuring temperatures and analyzing gas samples from the instrumented ^{238}Pu-contaminated waste storage drums and casks at the LASL waste storage area (see Table I). The drums and casks probably were not gas-tight and internal pressurization did not develop in 94 days. Initial data indicate that hydrogen diffuses rapidly through tuff and a significant gas pressure buildup in these containers is not expected.

Gas samples from the drums and the casks contained traces of organic degradation products in gaseous form with masses of approximately 60. Comparisons between amounts of organic

7915

products in corresponding drum and cask samples were as follows: DRUM 223 > CASK 223; DRUM 224 < CASK 224; DRUM 232 < CASK 232; DRUM 233 > CASK 233. Uneven distribution of the ^{238}Pu contaminant in these drums undoubtedly produced some thermal hot spots, and the combination of heat and radiolytic attack probably produced these organics.

Information was received from Mound Laboratories concerning the percentage composition and levels of contamination of their hydrogeneous waste above 10^4 nCi/g. We are awaiting samples of polypropylene plastic sheet from them to proceed with additional laboratory radiolysis experiments.

3. Miscellaneous. A. Zerwekh attended the following meetings: (1) February 4 at ALO to present radiolysis data to Robert E. Yoder, Asst. Dir., DOS, ERDA HQ, Washington; (2) February 19 at LASL, to discuss gas formation from radiolytic attack of hydrogeneous waste with Bob Lowrey, ALO; Norm McKay, ALO; N. Werkema, ALO; A. Kazanjian, RF; T. Keenan, LASL; and W. A. Goldsmith, LASL; (3) February 26 at LASL to discuss with SRP and ERDA-HQ visitors the various phases of WM programs at LASL.

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GRW:tb

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Table I

Data from ^{238}Pu-contaminated Waste in Covered-Trench Storage

(After 94 days' Storage)

Drum Number	^{238}Pu Content, g	Waste Content, kg	Temperature, °C: Inside drum	Temperature, °C: Outside drum		Gas Composition (Mol %): H_2	CH_4	O_2	CO_2	CO	N_2
223	14.9	17.5	12.0	12.0	DRUM	0.9	0.1	15	5.4	0.9	77
					CASK	< 0.1	< 0.1	20	< 0.1	0.3	79
224	22.1	14.5	16.5	12.0	DRUM	0.2	< 0.1	19	1.2	0.3	78
					CASK	0.1	< 0.1	20	< 0.1	0.1	79
232	29.4	10.2	20.0	12.5	DRUM	10	0.4	7.7	14	4.8	62
					CASK	0.5	< 0.1	20	< 0.1	0.5	78
233	17.0	14.5	17.5	11.0	DRUM	0.1	< 0.1	20	0.6	< 0.1	79
					CASK	< 0.1	< 0.1	20	0.1	< 0.1	79

Ambient air, 5°
Soil under casks, 7°