LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544

OFFICE MEMORANDUM

TO : Distribution

DATE: April 7, 1975

FROM : John Warren, H-8

SUBJECT : RETRIEVABLE STORAGE OF ^{238}PU WASTE

SYMBOL : H8-WM-450

We are about to receive our third shipment of ^{238}Pu heat-source waste from CMB-11, DP-West, for retrievable storage. For the prior two shipments (March, 1974, and October, 1974), we had no option regarding where to put this waste; the cement cask storage was the only available. Now, however, the Pit 9 facility is fully operational and we can, I feel, put some of the low ^{238}Pu content waste in this storage.

The ^{238}Pu-content of the waste received to date is given below, all for 115-liter drums:

Gram ^{238}Pu:	0-1	1-2	2-4	4-6	6-10	>10
No. Drums						
3/74 :	60	23	34	21	16	64
10/74 :	4	4	5	4	2	5
% of Total	26%	11%	16%	10%	8%	29%

The cost of the ^{238}Pu-cask storage, per drum, is about $100., including all handling, covering, etc. The comparable cost for Pit 9 storage is about $10. per drum, as best as we can now estimate it. Approximate cost savings therefore, had we been able to place some of the ^{238}Pu waste into the Pit 9 facility (which I feel provides equally adequate storage for the low ^{238}Pu-content drums), would be approximately $5760. with a 1.0 g ^{238}Pu dividing line for the two storage facilities, $8190. with 2.0 g as the dividing line, $11700. at 4.0 g, and $13950 at 6.0 g. These costs are very significant, and will increase when additional storage space has to be provided.

Cost, admittedly, must not completely govern our decision as to storage of the ^{238}Pu-waste. Other factors such as worker safety, and especially safety in containment, are not as easily quantified. We can, however, compare LASL with other sites, particularly the ITSA pad at INEL. Waste for placement there has the following restrictions: drums must

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be 2.3 mm polyethylene lined, 210-liter size, have penetrating radiation limited to an average of 30 mR/hr (surface dose) with no single package exceeding 500 mR/hr (surface dose), and have a maximum heating from nuclear decay of 10 watts per drum. Using these specifications we could, in theory, make 20 g of ^{238}Pu per drum as our dividing line.

Being somewhat on a conservative side, realizing we use a 115-liter size drum without the polyethylene liner, and recognizing the possible problem of radiolytic gas generation in the storage array, I propose we now begin use of 4.0 g ^{238}Pu per 115 liter size drum as our division point; at below 4.0 g ^{238}Pu in a drum the drum can be placed into the Pit 9 facility and at 4.1 g and above the drum requires cask storage. Based upon recommendations already received, I further propose that any drum containing >0.1 g ^{238}Pu in Pit 9 be clearly marked with "^{238}Pu Waste" stenciled on the side and top of the drum in 5 cm high-minimum letter size. Nuclear heating and radiation dose do not even approach "problem" levels at this limitation. While some gas (H_2) will be generated, the small number of drums - about 25 per year maximum at present levels - limits the overall problem in storage considerably.

I would like to have any questions, comments, changes, etc., on this proposal back to me by no later than April 15, 1975, so that we can issue a formal "Policy" on this matter. We do have another shipment of about 24 drums coming within the next month or so. Arguments for higher or lower limits also will be listened to.

JW:dl

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