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

OFFICE MEMORANDUM

TO : J. L. Green, CMB-11

DATE: February 7, 1961

FROM : Dean D. Meyer, H-1

SUBJECT: PROPOSAL OF METHOD FOR DISPOSAL OF ROUTINE AQUEOUS WASTES FROM THE TA-21 HOT CELLS

SYMBOL : H-1

I have read your memo of February 6 and agree with your proposal for waste disposal. When you are ready to send waste to the disposal area please contact John Enders, 7-4093, to arrange for entrance into the area. Enders can then contact Zia for cement delivery.

0690
TA-21

ORIGINAL SIGNED BY
DEAN D. MEYER

Dean D. Meyer

DDM:phf
cc: Enders, H-1
File

10014

[illegible]

OFFICE MEMORANDUM

TO : Dean De Meyer, [illegible] DATE : [illegible]

FROM : J. E. Green

SUBJECT: Proposal of Method for the Disposal of Routine Aqueous Wastes from the TA-21 Hot Cells

SYMBOL : CMB-11

The following is a description of a procedure developed for the disposal of routine aqueous wastes from the TA-21 Hot Cells and is being presented at this time for your approval.

The specific waste in question is the raffinate stream routinely derived from the aqueous reprocessing facility presently being operated in the hot cells. This stream, from the process presently in use, is generated in batches of 6 to 9 l. and contains the following materials:

1. Pu ~20-40 mg. total
2. γ activity ~ up to 300 curies (Mev) total of mixed fission products
3. HNO_3 ~2N
4. $Al(NO_3)_3$ ~1.5M
5. Fe ~20-30 gm. total

Small amounts of organics may be present due to incomplete phase separation in the extraction columns or the formation of aqueous soluble degradation products formed by the action of radiation and HNO_3 on the solvent.

Pretreatment before disposal consists essentially of absorbing the liquid in a mixture of vermiculite and Portland cement in proper proportions and in such a manner as to yield a dry product after complete setting.

Specifically, this consists of the following steps:

1. Approximately 4 l. of the solution to be disposed of is introduced into a disposable transfer container. This container has a total volume of ~6 l. and is designed to be used in conjunction with the transfer mechanism standard on all hot cell dryboxes. The can is constructed of dural, has a 1/8 in. wall and is equipped with a lid that is held in and sealed by an O-ring.

2. A mixture of 10 parts by weight of cement or 1 part by weight of fine vermiculite is added in ~300 gm. quantities in intervals spaced sufficiently to prevent boiling or rapid evaporation of the free liquid in the can. After each addition, the mix is stirred as thoroughly as possible using a shaped polyethylene stirrer with the manipulators.

3. The cement-vermiculite mixture is added in this fashion until the mix becomes too stiff to mix. Another ~ 500 ml. of cement-vermiculite mixture is added to cover the top of the mix, thereby insuring that any free liquid reaching the surface will be absorbed.

4. The stirrer is then forced down into the can and the stirrer mechanism cleaned with damp cheesecloth which is also placed in the can. The mix is then allowed to sit for 1[illegible] hr. in contact with the atmosphere, thereby allowing the concrete to cool and begin to set.

Concrete made in this way is solid after a few hours but not completely dry and hard for a matter of one to two weeks. The final product has a porous, flaky appearance and essentially no mechanical strength, i.e., it can be easily powdered with the fingers. No work has been done to investigate the durability and leaching properties of this material; therefore, the effect of direct contact with ground water is unknown.

After the cooling period, the lid is put in place and the can transferred to the disposal area. The standard disposal hole will be utilized. Prior to the disposal of the can, a block of concrete ~10 in. deep will be poured into the disposal hole and allowed to set. The disposal can will then be dropped into the hole and another 1 1/2 to 2 ft. of concrete will be poured on top.

Using this procedure, the liquid is first solidified in concrete, then sealed into a dural can and finally encapsulated in a concrete block, providing essentially three barriers to the dessimination of contamination by ground water movement.

J. L. Green

JLG:evc

cc: C. W. Christenson, H-7
CMB-11 File
Hot Cell File