TA21 0604

APPENDIX IV

CURRENT WASTE DISPOSAL PRACTICES FOR ROUTINE AND NON-ROUTINE WASTE

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One source of routine waste is the TRU (Transuranic material) considered to be contaminated less than 10 nCi/g, consists mainly of laboratory generated wastes, such as cheesecloth, paper, gloves, metal, glassware, and other small laboratory items. This could include some "line-generated" trash. The bulk of this type of waste is generated ~~principally~~ by CMB-11 at DP-West or by the groups who work in the CMR building; however, there are several other sites which generate this type of waste.

In the CMR Building, this waste is placed in plastic-lined, metal, flip-top cans located in the laboratories. The waste is removed from the cans daily. The plastic bags, sealed with masking tape, are deposited in plastic-lined trash dollies. When a dolly is full, its liner is sealed, also with masking tape, and removed. Before it is placed in a cardboard box, it is surveyed by a Health Physics Surveyor from H-1. If no excessive contamination is found, the plastic bag is sealed in a cardboard box marked by radioactive-contamination tape and placed in a radioactive-contamination marked Dempster Dumpster. The Dempster Dumpsters are emptied twice a week at Area G. The truck drives into the pit before spilling the contents of the Dempster Dumpster. After the waste is dumped into the pit it is covered immediately by crushed tuff to reduce the fire hazard. See figs.

Another source of routine waste is the de-watered sludge from the Liquid Waste Treatment Plant at TA-50. This material is packaged in 55 gal. (m^3) mild steel drums. The sludge could be contaminated by plutonium and/or uranium and include fission products. The drums are palletized - four to the pallet and taken to Area G. The palletized

8866

drums are then placed in the pit by fork-lift.

There are a variety of categories for non-routine waste. Contaminated oil is usually vacuum pump oil from the CMR Wing 9 Hot cells. It could be contaminated by uranium, plutonium, or other radioisotopes. The oil is placed in mild steel drums. If it is sorbed onto vermiculite, it is packaged in plastic containers. Contaminated oil is lowered into a 6 ft. (1.8m) diameter shaft at Area G.

It is requested that contaminated chemicals be neutralized and/or sorbed onto some neutral materials and packaged in metal containers filled with sorbent material. These metal containers are disposed of in pits and shafts.

Tritium - contaminated waste is normally packaged in asphalt-lined drums. These drums are disposed of in a 6 ft. (1.8m) diameter asphalt lined shaft at Area G.

Contaminated building debris and large pieces of laboratory equipment and machinery may or may not be packaged before ~~it is~~ they are disposed of in pits. The level of contamination dictates packaging. The decision to package is made by Group H-1 and Group H-8.

Disposal of contaminated animal tissue from the health research laboratories in HRL building is by shaft disposal.

"Sensitive material," e.g. tape from C-Division, is disposed of in pits. Any material in this category is considered unsuitable for disposal in the county sanitary landfill.

There are several waste classes:

Uranium
- ^{233}U
- ^{235}U
- ^{238}U
- D-38

*Transuranic >10 nCi/g ^{239}Pu or >100 nCi/g ^{238}Pu

**Transuranci <10 nCi/g ^{239}Pu or <100 nCi/g ^{238}Pu

Fission product or induced activity

Tritium

Records kept on these waste classes include volume and curie content on accrual and current basis; and also state mass of ^{235}U, kilograms of uranium, and grams of ^{239}Pu. Acreage used in disposal is reported on an accrual and current basis.

Packaging policy for solid radioactive waste is waste must be packaged so that ~~they~~ it will not contaminate transport containers or contaminate or irradiate personnel during transport. When necessary, special cases are checked to assure that DOT regulations are met. Packaging guidelines are listed in current waste disposal operating procedures.

For TRU material less than 10 nCi/g and for low-level uranium waste, plastic-bag lined cardboard boxes are widely used. Plastic bags (small plastic bags sealed inside of large plastic bags) are also used as well as metal drums of several sizes. Sometimes materials are received which do not require packaging but require that the openings be sealed. Examples: vacuum pump or glovebox. Building debris is normally very low-level waste. A canvas tarp is used to cover the dump-truck bed during transit.

For TRU material greater than 10 nCi/g plywood crates or metal drums are used. The usual size of the plywood crates is 4'x4'x8'. The size of the drums may be 30 or 55 gal. Materials which pose packaging problems are handled on an individual basis. In the

*Placed in retrievable storage. Retrievable storage also includes other transuranic isotopes and ^{233}U.

**Disposed non-retrievably.

case of filter plenums from the CMR building packaging would be too expensive ; therefore, all openings are sealed with metal flanges.

Transportation of radioactive waste from the waste generating sites to Area G, TA-54 is by Dempster Dumpsters, (either 4 or 10 cubic yard dumpsters), dump trucks, flat bed truck, or pickup truck. There is, also, a 1-ton stake body truck for transportation of materials from waste generating sites to TA-54. In all cases, the transportation of radioactive materials is carried out under guidelines set up in Standard Operating Procedures.

Dempster Dumpsters are used to transport approximately 80% of the waste. In the case of 55-gallon sludge drums generated at TA-50, ~~we utilized a~~ "Skip-Type" Dempster Dumpster containers are used. This type of container permits transit of 9 55-gallon drums per trip. Depleted uranium chips and turnings generated at the shops department area are also transported by "Skip-Type" Dempster Dumpsters. These chips and turnings are packaged in 30-gallon drums and are escorted because during transit there is a remote possibility of fire occurring in a container. This escort is provided by H-8 whose vehicle is equipped with radio-communication capability on the H-Division network as well as the Zia Company, fire and police department networks.

Transport of classified contaminated material by H-8 personnel is always escorted by Supply and Property personnel, SP-2 Group. Supply and Property must prepare the proper documentation for its disposal.

The use of dump trucks leaves a bit to be desired if they are used for transporting loose, non-packaged material. In the past, there has been a tendency to overload these trucks. Dump trucks are not routinely used to move radioactive waste.

Prior to August 1972, all laboratory generated waste ~~was~~ were placed in disposal pits or disposal shafts at Area G. After August 1972 several pits were prepared so that radioactive waste could be segregated according to its radioactive contaminants. For example, Pit #17 was used for receiving transuranic contaminated waste considered to be less than 10 nCi/g ^{239}Pu; Pit #21 was used for receiving low-level uranium waste; pit #8 was set aside for exclusive storage of de-watered sludge from TA-50; Pit #12 was utilized for storage of TRU material considered to be contaminated in excess of 10 nCi/g ^{239}Pu and Pit #16 was used for receiving uranium contaminated laboratory equipment.

Our disposal shaft areas include Shafts that are 2' in diam 25' deep, 3' in diam and 25' deep, 6' in diam and 60' deep, and 1' diamcement lined shafts 25' deep. The 6' diam shafts are used for either tritium contaminated waste or contaminated oil. The 3' diam x 25' shafts are used to receive boxed materials such as animal tissue or classified contaminated material which is too large to go into the two-foot diameter shafts.* Most of our waste is placed in the 2' diam. disposal shafts. This waste could include, but is not limited to ^{239}PU, $^{233,235}U$, fission product activity, and induced activity.

[illegible]

*If classified contaminated material were to be placed in a pit, it would require immediate covering with 3 ft. (m) of dirt. If immediate covering were not possible, then physical surveillance would have to be provided until covering took place.

Another series of shafts are 12" in diam. They were originally 3'diam. 25' deep shafts. A 12" diam. metal tube was positioned in the center of the shaft 1' above the bottom of the shaft. The void around the tube was filled with concrete. These shafts are used for extremely high-level plutonium material such as that generated in the hot cells of Wing 9, CMR Building. In addition to plutonium, the material could contain fission products as well. The material is usually packaged in a 1 gal. can and placed in a plastic cannister. The level of activity of each cannister is read at a distance of 1 meter and at contact. The activity is recorded on the disposal form. Two cannisters are then placed in the plastic-bag lined, lead transport container. The plastic bag is used only to insure that the cannisters do not hang when the transport container's trap-door is opened over a shaft. Two of these shafts have also been used for receiving extremely high-level tritium contaminated waste generated in the 10-Site tritium drybox line. This material was packaged in metal containers and sealed in the shafts with asphalt.

After shaft disposal if the radiation level at ground level is greater than 100 mr per hour, dirt is shoveled into the shaft until the radiation level at ground level is reduced to less than 100 mr per hour. In the event the radiation level exceeds 500 mr per hour, a radiation sign is posted at that shaft until subsequent deliveries reduce the level to less than 100 mr per hour.

When a disposal shaft is filled to within approx 4' of ground level, a truckload of ready mix cement is ordered and the shaft is plugged. The top of the plug is rounded so that water will drain

away from the shaft.

Each shaft disposal is logged into a permanent LA Notebook. The shaft number, date, description of the material, and if known quantity of fissile material is listed. The entry is signed by the person who supervised the disposal. Because of nuclear criticality safety, no more than 500 g of fissile material are placed in any one disposal shaft. This restriction cannot be waived except by written permission from the Nuclear Criticality Safety Officer.

Practically all disposals made into disposal shafts today require that the waste generator fill out a Solid Radioactive Waste Disposal Permit Form. This form requests the waste generator to identify the material, the radioactive isotopes, the quantity of radioactive materials either in grams and/or curies, and the methods by which this curie content was determined. The package must also meet the H-1 area representative's approval prior to pick-up; his signature is also placed on this form certifying the package is ready to be picked up. At the bottom of this form, space is provided for information regarding the date of disposal, and the disposal location which is filled out by the H-8 waste management person who actually did the disposal operation. This disposal permit becomes a permanent record of the disposal of this material. It is kept on file in the H-8 Waste Management section office. Eventually, it is planned to report all of these disposal operations onto a different form which will then be translated onto a computer tape.

The new ^{238}Pu Storage stores ^{238}Pu residues from DP West. These materials are packaged into 30-gallon drums by CMB-11 at DP-West. DP-West personnel record the contents of each drum and identify the drum by a number painted on its exterior. These drums are then transported from DP-West to TA-54 and off-loaded into concrete casks placed in trenches.

Retrievable waste records will eventually be placed on computer tape. At present record keeping for the ^{238}Pu waste disposal facility is a manual operation. Each trench is identified by letter. Each cask in the trench is given a number. In Trench A there are 120 cement casks. Two numbered 30-gallon drums fit inside one cask. Drums and other stored items are recorded on solid radioactive waste disposal permits and in an LA notebook which gives the date of the delivery, the area designation, the trench designation; and the cask location number and plastic identification tag number. Plastic identification tags are fastened to the lids of the casks and to each package of retrievable waste stored in Pit #9.

Prior to the disposal of capital equipment, the group owning the item fills out a form (252-R), Condemnation and Disposal of Classified and/or Contaminated Government Property. On the main portion of this form the item description is given, its serial number, and government property number, the group to whom it is charged, and the monitoring results of the Health Physics surveyor who has examined the article to determine the degree and extent of radioactive contamination. Down at the lower left-hand corner of this form, there is a box in which the Health Physics area representative signs and marks appropriately one or more boxes in this section to indicate his decision on how it should be disposed. The form is then sent to the Health Physics group office for certification. Then the form is mailed to the AEC Fiscal Management and Property Office where it is counter-signed. In the bottom center of this form is space for the group's property representative to affix his signature. After the three signatures are affixed, the form is sent to the H-8 waste management section upon receipt of the form H-8 personnel call at the site where the item is located, verify the property number(s) on the form, pick up the material and take it to the disposal area. After disposal has been completed, the H-8 representative who made the disposal will sign in the lower right hand corner of this form. The AEC Fiscal Management and Property Office has the right to witness actual disposal and H-8 Waste Management always calls the AEC office prior to pending disposals. After the disposal has been completed and the form signed, the form is then forwarded to SP-2 Group Office where the individual copies of this form are turned back to the people entitled to them. H-8 Waste Management receives the green copy of the form. After completion of the Property disposal operation,

the H-8 area representative will make an entry in an LA Notebook of this disposal operation which includes the item's description, serial number, and property number, its disposal location, and the serial of the form (252-R), and signs and dates the disposal. Quite frequently, H-8 Waste Management is asked to verify the disposal of a government property numbered item.

The pick up and disposal of government property numbered material is an important part of H-8 Waste Management functions. It is a non-routine operation, and the frequency with which we are requested to pick up property numbered items will vary from week to week. There have been occasions, especially during site decommissioning activities when requests to pick up property numbered items have occurred almost daily. At other times, it may be a week or more before a request is received.

The access gate to the disposal area is kept locked at all times except when a representative of the H-8 Waste Management section and/or their alternate is present. The security service also patrols Mesita del Buey, and normally makes a check on the access gate padlock twice during each of the three eight hour shifts. If security found the padlock unlocked, they would contact H-8 Waste Management personnel so that the gate could be relocked. The issuance of access gate padlock keys has been quite restricted. Since this restriction, there have been practically no incidences where the gate was left unlocked. ¶ Standard operating procedures for can be found in the H-8 Waste Management Section Office.

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In 1961 LASL employee Harlow Russ described the area as having 4 pits, each about 6 or 7 feet (183 or 213 centimetres) deep which were used from early 1949 through 1955 (Abrahams, written commun., 19[illegible]3). He estimated that the pits contained a total of several hundred kilograms of ^{238}U. About 80 percent of the usable volume of the pits had been backfilled in 1961. The undated engineering drawing ENG-R3644 shows that 6 pits were excavated at the site, as well as one underground chamber identified as structure HP-29 (fig. 7). Figure 7 (caption on next page) belongs near here.

Pit 1 is shown to contain miscellaneous polonium beryllium fired targets. This pit reportedly contained 240 curies of radioactivity and was inactive in July 1951. Pit 2 reportedly contained 60 curies of ^{210}Po. This excavation was not used after July 1950. Pit 3 probably was a hand-dug hole in which a G.I. can was buried in September 1951. This can contained "Berryllium dust immersed in keorsene." Pit 4, listed as active on the drawing, was a miscellaneous hot material dump. Depleted uranium and tungsten alloys of polonium may also have been buried in one or more of these pits. The contents of Pits 5 and 6 were not given and possibly were never used.