NIVERSITY OF CALIFORNIA
ALAMOS, NEW MEXICO 87544

# OFFICE MEMORANDUM

TO : DISTRIBUTION

DATE: Nov. 12, 1973

FROM : Keith Schiager, Environmental Section Leader

SUBJECT : MONITORING OF WASTE DISPOSAL AREAS

SYMBOL : H8-73-260

The need for comprehensive environmental monitoring of solid waste disposal sites, both active and inactive, is now generally recognized. Data from such a program would serve two basic functions: (1) in the context of routine surveillance for the verification of on-site confinement, and (2) in connection with waste management or radioecological research, to document the extent and rates of environmental translocation and related variables.

The following basic assumptions strongly influenced the monitoring considerations:

(1) the radionuclides of primary interest are now, and will continue to be, $^{3}H$, $^{238-239}Pu$ and $^{241}Am$, with lesser emphasis on some long-lived fission products and the isotopes of uranium.

(2) the demand for specific nuclide analyses, vs. gross activity measurements, will continue to increase.

(3) it will continue to be necessary to measure activity concentrations at natural background levels with good statistical reliability.

The media to be considered for monitoring are air, surface water, ground water, soil, vegetation and animals. Because of the limited amounts of gamma emitters in LASL wastes, external radiation was not considered to be an important environmental factor. Air sampling for particulate materials will be conducted with a limited number of samplers (e.g., 4 samplers at TA-50) in the vicinity of active areas only. Periodic sampling will be performed specifically for airborne tritium in the vicinity of inactive areas. The external radiation and air sampling portions of the program will be established by simply relocating existing monitoring devices; no additional equipment or manpower will be required.

The major effort will be devoted to measurements of soil properties and activity concentrations immediately under and around each waste pit. For this effort, there is

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a need for additional manpower and/or equipment. It is my firm belief that additional manpower should come from Laboratory overhead funds, rather than from project funds; the monitoring program must be recognized as an ongoing obligation of the Laboratory. Additional equipment, however, could well be obtained from project funds on a one-time basis. Analytical equipment with improved efficiency could alleviate, to some extent, the need for additional manpower.

The attached list of needed equipment would bring our analytical capabilities up to "state-of-the-art" and would significantly increase our throughput capability, as well as our quantitative detection limits for certain radionuclides.

KS/mlk

cc: L. Johnson
D. McCurdy
J. Mohrbacher
J. Herceg

EQUIPMENT REQUIRED FOR MONITORING OF SOLID WASTE BURIAL AREAS

| Equipment Item | | Estimated Cost |
|---|---|---|
| 1. For in situ measurements of soil properties: | | |
| a. Moisture | | |
| 1- Soil Moisture-temperature meter, Soiltest # MC-300A | | $240.00 |
| 20-Resistance soil blocks with 60 ft. leads, #MC-367 $15 ea. | | 300.00 |
| b. Density | | |
| 1 - apparatus for measurements by balloon method (ASTM-D-2167-63T), Soiltest #CN-666 | | 200.00 |
| c. Permeability | | |
| 1 - Tempe double-tube apparatus, Soiltest #A-95 | | 350.00 |
| | Sub-total: | $1,090.00 |
| 2. For analysis of radionuclide contaminants in samples of environmental media: | | |
| a. Detectors | | |
| 1 - Ge (Li) system; 15% of NaI efficiency, 1.8 keV FWHM, 40% P-to-C. | | 20,000.00 |
| 1 - Si (Li) system | | 6,000.00 |
| b. Analyzer | | |
| 1 - Canberra 8100, 4096 channel | | 15,000.00 |
| c. Peripheral electronics | | |
| 1 - NIM Bin | $ 600 | |
| 2 - Power Supplies | 1,000 | |
| 2 - Amplifiers | 1,500 | |
| 1 - Mixer/ Router | 900 | |
| | | 4,000.00 |
| | Sub-total | 45,000.00 |
| 3. Liquid scintillation counting system for high efficiency and stability with low background | | $17,000.00 |

? Cap Equip. or Eq

(1)

(2)