SPECIFICATIONS-HORIZONTAL MONITORING HOLES UNDER WASTE DISPOSAL PITS --- LOS ALAMOS

1. Introduction

Solid radioactive wastes have been placed in pits excavated in the volcanic tuff at Los Alamos Scientific Laboratory (LASL) since the beginning of laboratory operations in the early 1940's. Typically the pits are excavated to depths of 8 meters (25 feet) filled with waste to within one meter (3 feet) of the rock surface, and backfilled with uncontaminated crushed tuff. During the placement of waste in the pits, crushed tuff derived from pit excavations is interlayered with the waste, to a ratio of approximately three parts fill to one of waste material. Atmospheric moisture inputs to the waste pits is minimal, and it is believed that little if any migration of wastes has occured away from the confines of the disposal pits. However, no data are available concerning possible movement of radionuclides downwards from the bottom of the pits. It is intended to construct horizontal boreholes that pass beneath one of the disposal pits to determine the extent of radionuclide and moisture migration below the pit. The following document details the specifications for construction of these holes. Procedures required to insure adequate radiation protection, in the event contamination is encountered, are detailed in a separate, attached document.

2. Hole Location

A series of holes will be drilled, radiating from a single location, all of which are intended to pass beneath Waste Dis-

posal Pit #3, Area G, TA-54. Tentative locations of the first holes are indicated in the attached figure.

3. Hole Construction

The initial phase of construction for each hole will involve penetration of approximately 50 meters (150 feet) of tuff which is not beneath the waste disposal pit, and which is not suspected of being contaminated. The type of drilling used within this zone is at the contractor's option, and no coring is required. This access hole shall penetrate to a point 5 meters (15 feet) short of the near edge of the disposal pit.

Prior to further penetration, a casing will be grouted in place in the outer portion of the hole. This casing will serve to direct all return flow of air used during coring to a single location.

From a point 5 meters short of the waste pit edge, to the termination point of the hole, continuous coring employing air as a cooling fluid shall be used. The minimum diameter of the core shall be one inch. The intended termination point of each hole shall be 5 meters (15 feet) beyond the distant edge of the waste pit. However, termination of the hole may be required prior to that point due to drilling difficulties, or for radiation protection reasons as detailed in the S.O.P. (see Specifications, Item 6). The length of core runs shall be at most 6 meters (20 ft). Shorter runs may be required should recovery fall below 50 percent, or in the event significant contamination is encountered during the coring. Composite samples of cuttings from the coring operation will be collected at intervals of one meter (3 feet).

A minimum of three holes, of average length 100 meters (300 feet) will be constructed. Additional holes will be constructed contingent upon available funds and success of the first three holes.

4. Hole Survey

The design location of each hole centerline is 0.6 meters (2 feet) below the bottom of the waste pit. Sufficient hole surveys shall be conducted, and appropriate directional corrections made to insure that the actual centerline does not deviate more than 0.3 meters (1 foot) above or below the design elevation. The actual borehole may deviate by no more than one meter (3 feet) horizontally to either side of the design position. Upon completion of each corehole, the contractor shall provide LASL with a survey log showing the horizontal and vertical position of the entire hole.

5. Sample Collection

The collection, logging and disposition of samples shall be the responsibility of LASL during the entire operation. The contractor shall cooperate with LASL representatives to the end of obtaining cutting and core samples which are of the best possible quality. Costs incurred due to field modification of drilling or coring procedures shall be the responsibility of LASL at the previously agreed upon rates for time and equipment.

6. Hole Completion

Upon termination of the corehole, the entire hole shall be reamed to a nominal diameter of 0.17 meters (6 inches). The drilling mode used is at the contractor's option, but

no water shall be introduced into the hole during the reaming operation. The steel casing set in the outer 20 feet of the hole shall be provided with a threaded steel cap, and shall extend a minimum of 2 feet from the vertical face of the platform excavation.

7. Radiation Protection

All radiation protection measures required are detailed in the attached S.O.P. All monitoring, assay and filtration equipment required shall be provided by LASL.

8. Responsibilities

The Environmental Surveillance Group (H-8) shall assume responsibility for direction and coordination of the project. They shall insure completion of relevant surveying and construction of ramps and access roadways required prior to initiation of drilling activities. The Health Physics Group (H-1) will assume responsibility for all radiation protection aspects of the project, under the coordination of H-8. As outlined in the attached S.O.P., H-8 shall insure adequate decontamination of any drilling equipment which is radioactively contaminated during the operation, or insure appropriate disposal of such items should decontamination be impossible. The contractor shall receive compensation from LASL for such items at previously agreed upon rates. Decisions regarding the continuance or abandonment of any particular hole at any phase of drilling shall be made by H-8 personnel.

The contractor shall be responsible for installation, operation and maintenance of all drilling equipment, and for all necessary materials related to that drilling. He

shall cooperate with all required Health Physics procedures, as described in the attached S.O.P. He shall provide hole surveys as required to demonstrate and insure the required hole alignment, either with his own facilities or through subcontracts. Any and all subcontract activities shall fall under the same category as the principle contractor regarding health physics control.