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REPOSITORY
COLLECTION Biology at Medicine
BOX No. 27
FOLDER 5

THREE-DIMENSIONAL HYDROLOGY

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Hydrology is a primary area of interest in the earth sciences research program at the Hanford Project. This research program is concerned with the selection and measurement of those characteristics peculiar to the soil environment and the application of such measurements to assure the adequacy of plant safeguards for the ground disposal of radioactive liquid wastes. In addition to providing competence in these surveillance aspects, this research is providing the tools necessary for predicting future waste movements and the significance of major environmental changes (e. g., a dam adjacent to the Project).

Soil and mineral chemistry studies have resulted in an extensive knowledge of the mechanisms whereby radionuclides are removed from liquid waste streams. Both basic and applied studies of the reactions of naturally-occurring soil materials with radioactive species in solution have led to increased understanding and greater appreciation of soils as chemical reaction and ion exchange media.

Hydrology and geology research have produced new, more exact techniques for predicting and explaining the movement of wastes and ground waters in saturated and partially-saturated soils. Of particular importance in this comprehensive study is the development of experimental methods for measuring and mathematical formulations for analyzing the movement of fluids in complex, three-dimensional flow systems.

Field investigations employing special equipment, instruments and techniques--in many cases, designed and developed at Hanford--have permitted accurate tracing and mapping of wastes and contained radionuclides through the subsurface environment.

In combination, these earth sciences studies have resulted in the development of a highly integrated body of knowledge which provides major support and verification of the safeness and practicability of ground disposal at Hanford. In addition, the expanded technical depth and breadth of this research has also produced results which have both

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specific and general applications in many non-nuclear fields, e.g., liquid waste disposal, ground-water movement, irrigation, land use, geology, mineralogy and ion exchange technology.

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