

Rosholt, J.N., and McKinney, C.R. 1980. Uranium Series Disequilibrium Investigations Related to the WIPP Site, New Mexico (USA), Part II. Uranium Trend Dating of Surficial Deposits and Gypsum Spring Deposit Near WIPP Site, New Mexico. Open-File Report 80-879. U.S. Geological Survey, Denver, CO.

INTRODUCTION, p. 1;

" Just how suitable salt beds are for permanent disposal of radioactive wastes has been the subject of extensive studies covering diverse aspects over the past decade. The proposed site of the Waste Isolation Pilot Plant (WIPP) is located in southeastern New Mexico, about 42 km east of Carlsbad, where plans are to construct the storage facility in rock salt beds of the Permian Salado Formation. Detailed surface and subsurface geology at the site and of the surrounding area has been discussed previously (Bachman, 1976; Powers and others, 1978).

A basic concern for waste repositories in salt beds is their high solubility in ground waters. Different kinds of dissolution features are known in most evaporite basins including the Delaware Basin, the region of the proposed WIPP site. Some primary questions that can be posed are: 1. Is there active dissolution of salt at or near the site of WIPP? 2. Is the process of salt dissolution continuous or episodic? 3. If episodic, what is the correlation between time and depth? 4. When did the last salt dissolution cycle occur? 5. What is the rate of dissolution?

Rosholt and others (1966) and Rosholt (1978) demonstrated that a process of isotopic evolution of uranium and thorium occurs in most types of sediments, altered volcanic ashes and deeply buried granites provided that some groundwater is allowed to migrate through the porous zones of these materials during their geologic history. Often the analyses of the isotopes of the ^{238}U - ^{234}U - ^{230}Th - ^{232}Th system yield an estimated age for the time of deposition (uranium-trend age estimate) over the range of the method from 2,000 to about 800,000 years ago (Rosholt, 1978). Accordingly, it was felt that a preliminary study of salt dissolution residue samples near the WIPP site may yield insight into the dissolution processes and/or it may provide a uranium-trend age estimate for the most recent salt dissolution that produced clay residuum and bands of gypsum. The application of uranium trend dating in the investigation of the age of surficial deposits in the area east of Carlsbad, New Mexico, is included in Part II of this report."

Table 5, p. 15;

" Uranium-trend ages of surficial deposits in Nash Draw and Hat Mesa, New Mexico quadrangles.

Deposit	U-trend slope	x-intercept ^{232}Th index	Half period of F_{10} (10^3 yr)	Age (10^3 yr)
Berino soil	-0.533	-0.480	140	330 \pm 75
Mescalero caliche				
Upper part	-2.34	+0.036	590	420 \pm 60
Lower part	-.419	+0.182	370	570 \pm 110
Gypsum spring	-.889	-.196	340	380 \pm 60"

