

GEOMORPHIC CHARACTERIZATION OF TECHNICAL AREA 21, LOS ALAMOS
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TA-21

ABSTRACT

A geomorphic characterization of TA-21 was undertaken primarily to provide site-specific data on surficial processes that pertain to the potential erosion and deposition of contaminants. An additional objective was to define the geomorphic setting of DP Spring, a perennial spring that contains contaminants probably originating from TA-21. These studies support RFI work at OU-1106 for the Environmental Restoration Program.

Sediment deposition areas downslope of MDAs at TA-21 include the narrow grassy floor BV Canyon south of MDAs B and V, and the broader grassy flat within DP Canyon north of MDAs A, T, and U. The floor of DP Canyon includes alluvium and slopewash of widely varying age, and these sediments record alternating cycles of sediment deposition and erosion extending back at least 27,000 years. The most recent cycle occurred in historic time, and up to 6 ft of sediment was deposited and subsequently partially eroded since major development began in the drainage basin. These historic sediments constitute a significant potential storage area for contaminants within DP Canyon, including plutonium which has been documented previously in DP Canyon sediments.

Cliff retreat processes and rates apparently vary dramatically between cliffs bordering Los Alamos Canyon and cliffs bordering the shallow tributary canyons at TA-21, including DP Canyon. Partially-detached landslide blocks along Los Alamos Canyon demonstrate that cliff failure can extend up to 75 ft or more back from the mesa edge, and the fresh appearance of the cliff faces also suggests relatively frequent failures. In contrast, retreat of cliffs bordering the tributary canyons probably involves failure of small, fracture-bounded blocks, and extensive erosional pitting of these cliffs suggests long time periods between failures. The occurrence of old alluvial deposits in one shallow tributary canyon at DP Mesa further suggests that these tributaries were

