

United States
Department of
Agriculture

Soil
Conservation
Service

Northeast NTC
160 East 7th Street
Chester, PA 19013-6092
215-499-3960

Subject: GPR Technical Assistance -
ARS, Beckley, WV

Date: 2 January 1990

To: Rollin N. Swank
State Conservationist
SCS, Morgantown, WV

Purpose:

To provide ground-penetrating radar (GPR) research assistance within a small watershed near Beckley, West Virginia. Assistance supported research efforts of soil scientists, hydrologists, and geologist of the ARS and Cornell University.

Principal Participants:

Dr. Larry Cathles, Professor, Geology Dept., Cornell Univ., Ithaca, NY
Jim Doolittle, Soil Scientist, SCS, Chester, PA
Dr. Gary Pasquarell, Hydrologist, ARS Beckley, WV
Stacy Ricci, Graduate Student, Geology Dept., Cornell Univ., Ithaca, NY

Activities:

GPR unit arrived in Beckley on the evening of 26 November 1989. Field work was conducted on 27 and 28 November 1989. The unit returned to Chester, PA, during the afternoon and evening of 28 November 1989.

Discussion:

GPR survey was conducted in an area of Gilpin soils on steep and very steep slopes. Successive transects were completed by hand towing the 120 MHz antenna and the SIR System-8 radar unit along established grid lines. The radar unit consisted of the model 4800 control unit, model SR-8004H graphic recorder, and model DT-6000 digital tape recorder. The unit was powered off of a marine battery.

Survey work was hampered by inclement weather and the steep slopes made hand-towing the radar unit arduous. The batteries used to power the radar unit were not fully charged. This affected the synchronization of the graphic image recorded on digital tape recordings.

Radar profiles were clear and interpretable. Radar profiles were examined, annotated, and discussed during a departure conference. Maximum depth of penetration ranged from 2 to greater than 5

meters. These depths were considered exceptional and reflect the resistive nature of the underlying, predominantly sandstone bedrock. Soil and bedrock features were identified on all graphic profiles. All recordings were turned over to Dr Cathles and Stacy Ricci of Cornell University for processing on a Landmark Work Station.

I appreciated this opportunity to work in your state and with members of ARS. With kind regards.

James A. Doolittle
Soil Scientist (GPR)

cc:

A.J. Dornbusch, Jr., Director, MWNTC, SCS, Lincoln, NE
W.F. Hatfield, State Soil Scientist, SCS, Morgantown, WV
C.S. Holzhey, Assistant Director, Soil Survey Division, NSSC, SCS, Lincoln, NE
E.G. Knox, Staff Leader, NSSL, NSSC, SCS, Lincoln, NE
C.G. Olson, Soil Scientist, Field Investigation Staff, NSSL, NSSC, SCS, Lincoln, NE