United States Department of Agriculture
Natural Resources Conservation Service Chester, PA 19013

Subject: Ground-Penetrating Radar Assistance and Training; Barnstable, Duke, and Plymouth Counties, Massachusetts; 15-18 May 1995 Date: 26 May 1995

To: Richard J. Scanu
State Soil Scientist
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Purpose:
To provide ground-penetrating radar (GPR) soil and archaeological field assistance and training.

Participants:
Edward Bell, Senior Archaeologist, Massachusetts Historical Commission, Boston, MA
Rudolph Chlanda, Geologist, NRCS, Amherst, MA
James Doolittle, Research Soil Scientist, NRCS, Chester, PA
Donald Liptack, District Conservationist, NRCS, Barnstable, MA
Phil Olson, Earth Team Vol., NRCS, West Wareham, MA
Tony Orloski, Earth Team Vol., NRCS, West Wareham, MA
Dave Skinas, Archaeologist, NRCS, Berlin, VT
Meredith Slater, Soil Scientist, NRCS, West Wareham, MA
Steve Spear, Soil Conservationist, NRCS, Barnstable, MA
James Turenne, Soil Survey Project Leader, NRCS, West Wareham, MA

Activities:
I completed my travel to West Wareham, Massachusetts on the morning of 17 May 1995. The afternoon of 17 May was spent familiarizing soil scientists with the operation of the SIR-2 System and preparing for field work. On 18 May, archaeological field investigations were conducted on Martha's Vineyard. On 19 May, several bogs were transected with the SIR System-2 in Barnstable and Plymouth counties. I returned to Chester, Pennsylvania, on 20 May.

Equipment:
The radar unit used in this study was the Subsurface Interface Radar (SIR) System-2 manufactured by Geophysical Survey Systems, Inc. (GSSI). The SIR System-2 consists of a digital control unit (DC-2) with keypad, VGA video screen, and connector panel. The system was powered by a 12-volt battery. The models 3110 (120 mHz) and 3102 (500 mHz) antennas were used in this investigation.

Results:
1. A copy of a video tape covering the general theory of GPR, and the use and operation of the SIR System-2 radar unit was given to Jim Turenne. This field trip provided Jim Turenne with an opportunity to become familiar with the operation of the SIR System-2 radar unit.

2. The ground-penetrating radar survey of the archaeological site on Martha's Vineyard produced limited results. The site was a cemetery for mariners which had long-since fallen into disuse. The objectives of the survey were to identify the locations of individual grave sites and to delimit the boundaries of the cemetery.

The cemetery was located in an area of Carver (mesic, uncoated, Typic Quartzipsamments) soils. Depths of observation were not restricted as levels of signal attenuation were low in areas of Carver soils. A 500 mHz antenna was used in this investigation. Numerous rock fragments were evident on the soil surface and within soil profiles. The large number of rock fragments at this site confused interpretations, masked the identification of grave sites, and limited the usefulness of GPR techniques.

Radar images were confirm by auger observation at ten locations within the survey area. No artifacts and negligible evidence supporting disturbances were noted in these observations.

While the radar provided limited results, this survey was helpful in fostering a stronger partnership between NRCS and the Massachusetts Historical Commission.

3. The SIR System-2 radar unit is highly portable and well suited to the surveying of cranberry bogs in eastern Massachusetts. The collected data will be summarized by Jim Turenne.

4. Because of the schedule of activities in eastern Massachusetts, it was not possible to conduct bedrock investigations with the SIR System-2 unit in Franklin County. As this radar unit appears to be exceptionally well suited for use in relatively inaccessible areas and inhospitable terrains, it is recommended that this activity be rescheduled and completed next fall (late November or early December).

With kind regards.

James A. Doolittle
Research Soil Scientist

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