United States Department of Agriculture | Soil Conservation Service | 160 East 7th Street Chester, PA 19013-6092

Subject: Archaeological Investigation Beltsville Plant Material Center; Beltsville, Maryland, May 28, 1991 **Date:** June 21, 1991

To: Robert J. Klumpe
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Purpose:
To conduct a ground-penetrating radar archaeological site investigation of a cemetery site within the Beltsville Plant Material Center.

Participants:
James A. Doolittle, Soil Specialist, SCS, Chester, PA
Anne M. Lynn, State Biologist, SCS, Annapolis, MD

Activities:
All field work was completed on 28 May 1991.

Equipment:
The ground-penetrating radar unit used in this study is the Subsurface Interface Radar (SIR) System-8 manufactured by Geophysical Survey Systems, Inc. [1]. Components of the SIR System-8 used in this study were the model 4800 control unit, ADTEK SR 8004H graphic recorder, ADTEK DT 6000 tape recorder, power distribution unit, transmission cable (30 m), and the model 3110 (120 MHz) and the model 3102 (500 MHz) antennas. The system was powered by a 12-volt vehicular battery.

Field Procedures:
A 60 by 55 foot grid was established across an area believed to be the site of a former cemetery. The grid included the headstones of two graves. The grid interval was 5 feet. Radar traverses were completed along each east-west grid line with both the 500 and 120 MHz antenna. Traverses were completed on both the north and south sides of the grid line with the 500 MHz antenna. Traverses were completed on only the north side of each grid line with the 120 MHz antenna. A range of 70 nanoseconds was used with both antennas.

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1. Use of trade names in this report is for identification purposes only and does not constitute endorsement by the authors or their institutions.

Assuming a dielectric constant of 8 for the medium textured Rumford (coarse-loamy, siliceous, thermic Typic Hapludults) and Sunnyside (fine-loamy, siliceous, mesic Typic Hapludults) soils within the cemetery, this range provided a profiling depth of about 9 feet.

The 500 MHz antenna provided superior resolution of subsurface features. However, larger subsurface features and soil horizons were more easily identified with the 120 MHz antenna.

Discussion:
Several exploratory radar traverses were conducted across the area immediately in front of the two headstones. Radar traverses were perpendicular to the long axis of the graves. These traverses were conducted to learn the appearance or the "graphic signature" of the burials on the radar profiles. It was anticipated that once the graphic signature of the burials was known, the presence and location of other unmarked burials within the cemetery could be identified and properly located.

The enclosed radar profile is from this initial survey of the grave sites. The two dashed, vertical lines appearing in this profile represent the location of the center-line of each headstone. In the area between the two headstones, images of soil horizons and strata have been abruptly truncated and are noticeably absence. This area appears to have been excavated and later re-filled with earthen materials. The lack of subsurface images and the rectangular shape of this area suggest the location of a former trench. However, as no recognizable anomaly occurs within this rectangular area either (i) the radar has failed to detect the burials or (ii) the artifacts have been removed.

No other features similar to the trench-like anomaly were detected within the grid. A computer-generated diagram of the cemetery has been prepared from interpretations of the radar profiles. In the enclosed diagram of the study area, the area of the suspected trench has been identified with the letter "A". The location of the grave site containing the two headstone has also been delineated in this diagram. Radar traverses identified the locations of several point reflectors (*) and two areas of disturbed soil (B and C). Several of the point reflectors are closely space, occur at similar depths, and are believed to be related. The point reflector represent either rock fragments or buried artifacts.

The disturbed areas generally have truncated soil horizons and distinct near-surface images. These areas may be manifestations of soil erosion or possibly may represent the location of former structures.

Conclusions:
The radar survey failed to disclose the occurrence of additional burials within the boundaries of the former cemetery. It is possible that because of existing soil conditions and the nature of the artifacts, the GPR was unable to discern buried remains at this

site. The GPR did discern several point reflectors suspected to be artifacts, two areas of disturbed soil conditions, and one area whose shape and graphic signature suggests the location of a former trench. As the trench-like feature is located between the centerlines of the two headstones, it is undoubtedly related to the headstones. No other similar feature was identified within the gridded area.

All graphic profiles have been return to Anne Lynn. It was a pleasure to work with Anne and I thank you for this opportunity.

With kind regards.

James A. Doolittle

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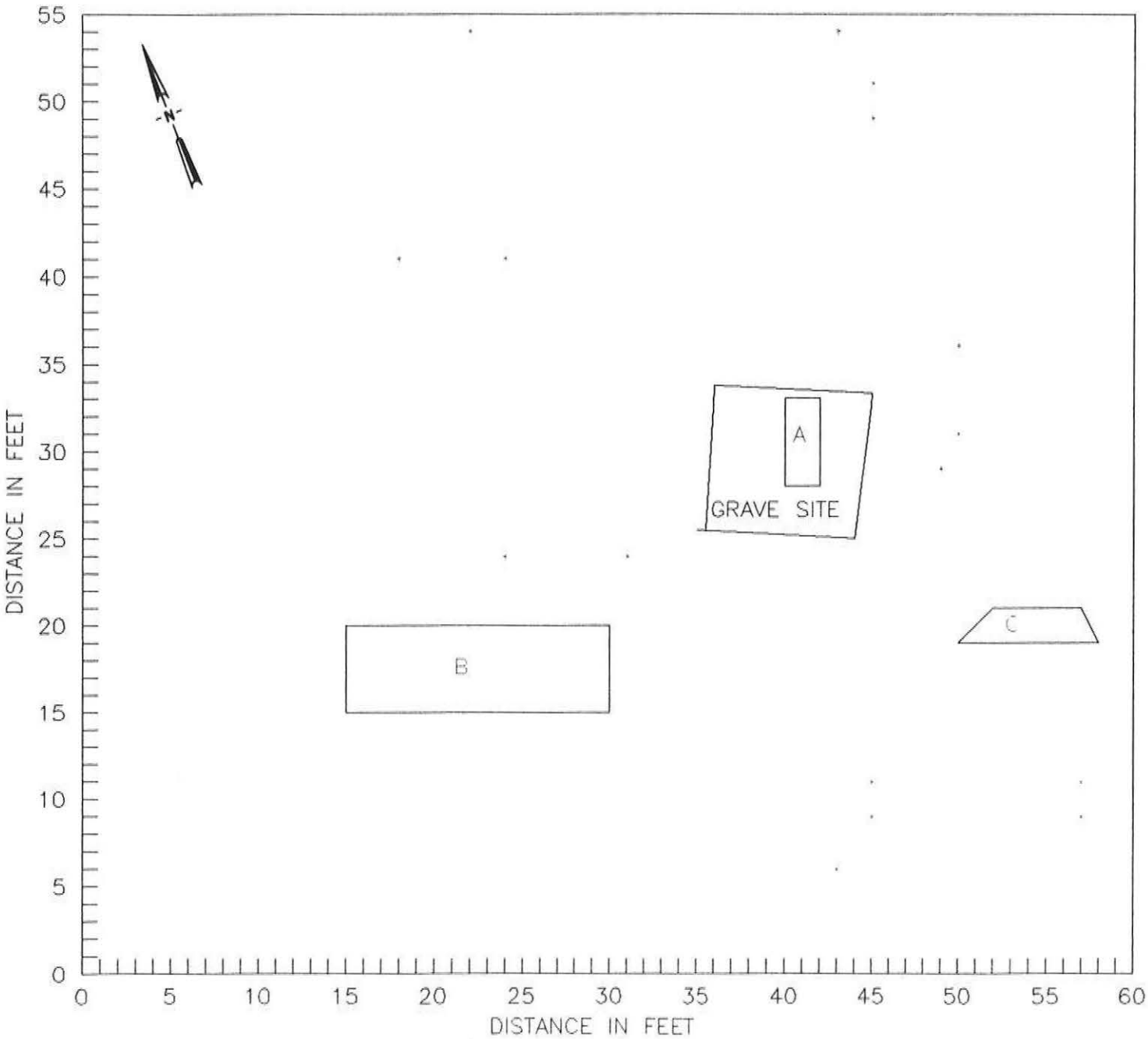
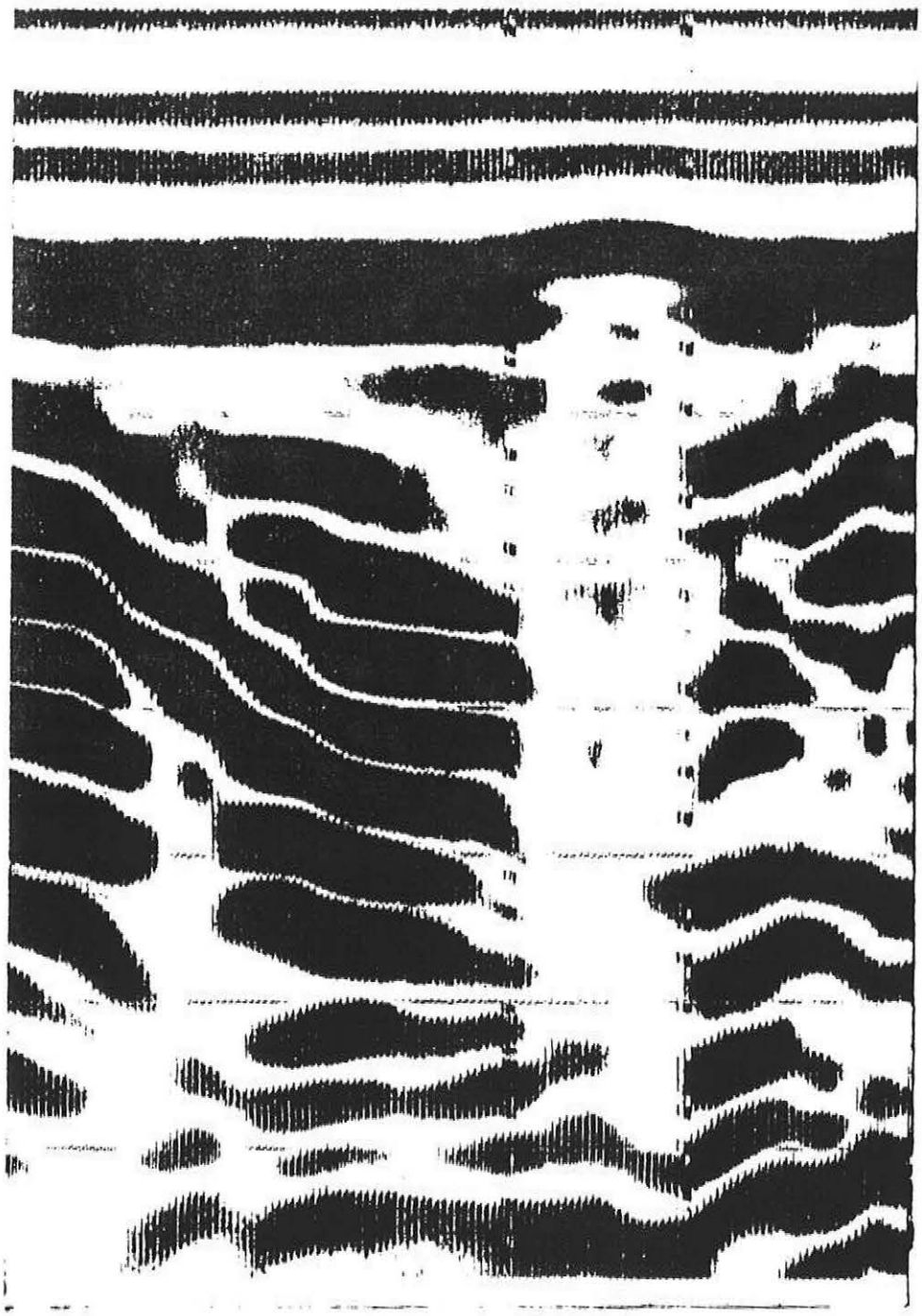
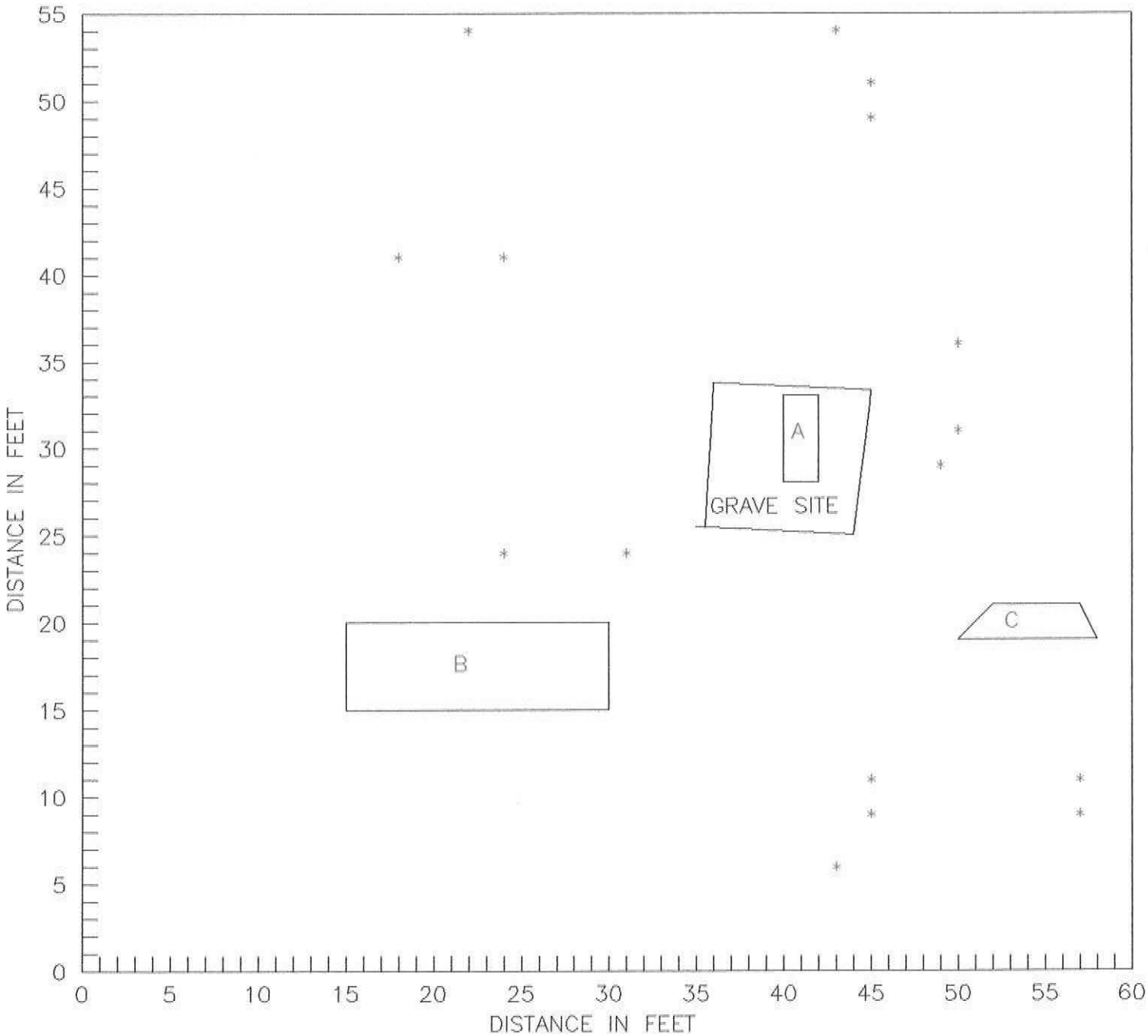
CEMETERY AT BELTSVILLE PLANT MATERIAL CENTER

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