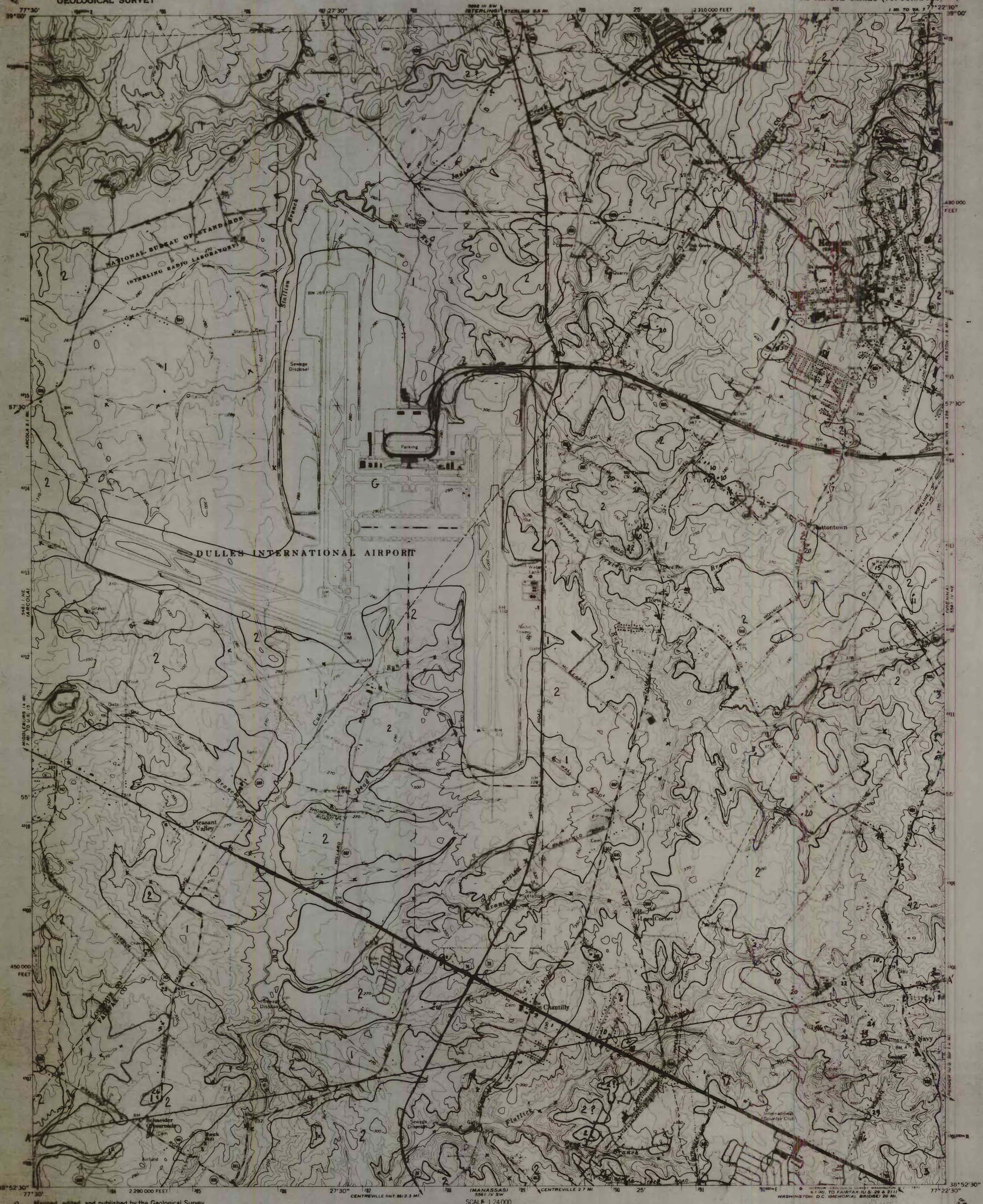
Open File 76-310

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HERNDON QUADRANGLE
VIRGINIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1949. Field checked 1951. Revised from aerial photographs taken 1964. Field checked 1966

Polyconic projection. 1927 North American datum
10,000-foot grid based on Virginia coordinate system, north zone
1000-meter Universal Transverse Mercator grid ticks, zone 18, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Revisions shown in purple compiled from aerial photographs taken 1971. This information not field checked
Purple tint indicates urban areas

SCALE 1:24 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy duty — Light duty
Medium duty - - - Unimproved dirt
U.S. Route — State Route

UTM GRID AND 1971 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C. 20242
AND VIRGINIA DIVISION OF MINERAL RESOURCES, CHARLOTTESVILLE, VIRGINIA 22903
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

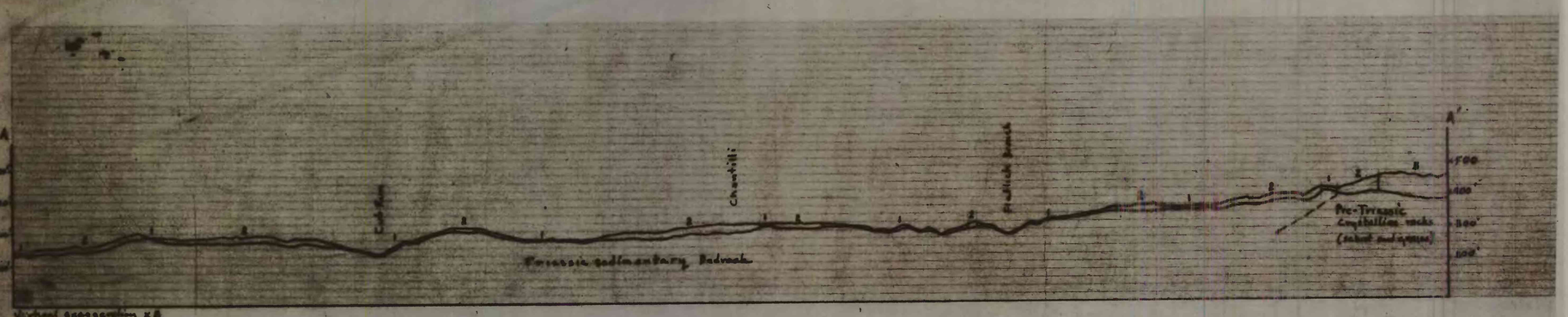
VIRGINIA
QUADRANGLE LOCATION

HERNDON, VA.
N3852.5—W7722.5/7.5

1966
PHOTOREVISED 1971
AMS 5561 IV NW—SERIES V834

THICKNESS OF OVERBURDEN HERNDON QUADRANGLE, VIRGINIA

A. NELSON, 1976



Vertical exaggeration x8

Thickness of Overburden, Herndon Quadrangle, Va.

This map shows the generalized distribution of overburden thickness in the Herndon quadrangle. Overburden includes all unconsolidated materials overlying fresh bedrock. These are soil, artificial fill and disturbed ground, alluvium, terrace deposits, colluvium lag gravels, residuum on sedimentary rocks, and saprolite on crystalline rocks. Generally the overburden is easily moved by power equipment.

Residuum forms the most extensive overburden in the quadrangle. It is a soft, generally dark red, earthy to clay-rich material that results from chemical weathering of sedimentary rocks. The residuum thickness varies from 0-50 feet (0-15 m), but is mostly between 5-15 feet (1.5-4.5 m), rarely is it more than 25 (7.5 m) thick.

Saprolite comprises the thickest overburden in the quadrangle. Its distribution is mostly limited to patches along the east border where it covers the crystalline bedrock from which it is derived by chemical weathering. Saprolite ranges from zero to more than 87 feet (0-26 m) in thickness. It is a soft, micaceous, clay-rich, yellowish-brown to brownish-red earthy material. Commonly textures and metamorphic structural features are preserved in the saprolite, but in some places the alteration was so intense that textures and structures are not preserved.

An area containing artificial fill and disturbed ground is outlined on the map around Dulles International Airport. The overburden thickness is variable, but is believed to range from zero to 13 feet (0-4 m) thick.

Other types of this overburden include stratified alluvial and silty or clayey sand and gravel stream terrace deposits in and along stream valleys, and unbedded colluvium and residual lag gravels on hill slopes and uplands. These types of overburden seldom exceed 10 feet (3 m) in thickness.

Except for the large area of artificial fill and disturbed ground, the overburden is contoured on 10 (3 m) and 50 (15 m) feet thickness intervals. This map is based on field data which includes saprolite thickness observation, elevations of fresh outcrop-overburden contacts, and overburden thickness estimates from drilled water well logs, as well as published and unpublished references. In places supporting data for thickness evaluations is sparse and the map is considerably generalized. Thickness variations can occur over relatively short distances; therefore this map should not be used for detailed site investigations, which require engineering, drilling and seismic studies to determine specific site characteristics for a given construction purpose.

Generally upland areas contain the greatest thickness of overburden. The greatest amounts of overburden are in those areas underlain by crystalline rocks (schist and gneiss) along the east border. These relationships are indicated in the cross sections.

Possible map uses

Rapid evaluation of relatively large areas for varied types of construction purposes can be made including preliminary cost estimates based on volumes of easily removed overburden on proposed construction sites. When used with the bedrock or Preliminary geologic map (Eggleton, 1975) those areas of relatively thin overburden could be determined which are underlain by strong bedrock, which is required for heavy construction sites.

This map, used in conjunction with the Preliminary geologic map and soils data (Porter et al, 1963) would be an aid in evaluating areas for sanitary landfills, septic tank and industrial waste leaching fields. It can also be used to determine favorable corridors for buried transmission and sewage lines, and in planning highway construction.

References cited

Eggleton, R. E., 1975, Preliminary geologic map of the Herndon quadrangle, Va.; U.S. Geol. Survey open-file report no. 75-388.

Engineering geology of the Northeast Corridor, Washington, D. C. to Boston, Massachusetts, 1967: U.S. Geol. Survey Miscellaneous Geologic Investigation Map 1-514-A, B, C.

Froelich, Albert J., 1975, Thickness of overburden map of Montgomery County, Maryland: U.S. Geol. Survey Misc. Invest. Map Series, 1-920-B.

Milton, Charles, and Bennison, A. P., 1950, Preliminary geologic map of the Fairfax, Virginia and part of the Seneca, Virginia-Maryland quadrangles: U.S. Geol. Survey open-file map scale 1:62,500.

Neuschel, S. K. and Froelich, A. J., 1975, Thickness of overburden maps, Vienna quadrangle, Va.; U.S. Geol. Survey open-file report no. 75-520.

Porter, H. C., Derting, J. H., Elder, J. H., Henry, E. F., and Pendleton, R. F., 1963, Soil survey of Fairfax County, Virginia: U.S. Dept. of Agriculture, Soil Conservation Service in cooperation with Virginia Agriculture Experiment Station and Fairfax County, Virginia, Series 1955, no. 11, 103 p.

Explanation

General thickness of overburden in feet

G	Large area of graded and disturbed ground, overburden thickness variable; 0-13+.
3	Greater than 50
2	10-50
1	0-10
S	Bedrock outcrop, all outcrops not shown
25•	Drill hole, approximately located; number indicates overburden thickness over bedrock estimated from drillers logs or inferred from casing length in water wells.