LANDFORMS MAP OF ANNANDALE QUADRANGLE, VIRGINIA

This map shows landforms by three major subdivisions: lowlands (Units 1a and 1b), uplands (Units 3a, 3b, and 3c), and the valley walls (Units 2c and 2d). The landform categories are closely related to general slope; thus, categories designated by "a" have slopes generally less than 3%, "b" indicates slopes generally from 3% to 8%, "c" indicates those from 8% to 15%, and "d" indicates slopes generally more than 15%.

The Annandale Quadrangle lies in two physiographic provinces--the Piedmont and the Coastal Plain; the boundary between them, the Fall Line, extends northeast-southwest. The Coastal Plain, in the southeastern third of the quadrangle, is characterized by relatively flat uplands, generally at altitudes below 250 feet; the Piedmont, in the northern and western part of the quadrangle, is characterized by older and more rugged uplands that rise to altitudes of 250 to 420 feet. (See cross-section A-A'). The land slopes gently to the southeast, and all streams flow in that general direction. The dendritic stream pattern is characterized by both broad, flat-bottomed valleys and narrow, deeply incised gorges. Holmes Run, for example, first meanders through a broad alluvial valley and then, in the eastern part of the quadrangle, flows through incised meanders in a narrow rocky gorge as it passes from the Piedmont to the Coastal Plain, emerging into a broad alluvial valley.

The dominant geomorphic processes that affect the landforms are closely related to the major landform categories. Fluvial processes dominate in the lowlands, and mass movement is dominant on the valley walls. In the uplands, chemical weathering is significant, but mass movement is also important in the more rolling areas.

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EXPLANATION OF MAP UNITS

Landform Unit	Generally Slopes	Description
Lowlands:		
1a	Less than 3%	Nearly level flood plains of major streams, underlain by alluvium and subject to periodic flooding of varying intensity. Two man-made recreational lakes are included, and other potential sites exist.
1b	Less than 8%	Gently sloping plains, differentiated from Unit 1a by somewhat greater local relief, as much as 20 ft. Locally underlain by alluvium and subject to flooding by major storms. In southeastern corner of Quadrangle includes edge of a long abandoned alluvial meander of the Potomac River.
Valley Walls:		
2c	8% to 15%	Moderately sloping valley walls, transitional between valley flood plains and the adjacent uplands. Local relief usually less than 125 ft., but in places to 200 ft.
2d	15% or more	Includes the steeper valley walls, with slopes generally 15% to 30%, but maximums of 30% to 40% occur in a few places along Accotink Creek and Holmes Run. Local relief commonly less than 125 ft., but in places to 200 ft.
Uplands:		
3a	Less than 3%	Nearly level upland, typically in Coastal Plain of southeastern part of Quadrangle at altitudes of 200 to 270 ft., with relief of 20 to 50 ft. Broad open terrain, marked by gravel pits. Dissected by streams that have cut flat-bottomed valleys 50 to 100 ft. deep.
3b	3% to 8%	Undulating upland, typically in Piedmont of northwestern part of Quadrangle at altitudes of 300 to 420 ft., with relief generally less than 50 ft. Dissected by streams that have cut valleys of varying width to depths of 100 ft. or more, with upland crests rising in a few places as much as 200 ft. above the adjacent valleys.
3c	8% to 15%	Rolling to hilly upland, differentiated from Unit 3b by steeper slopes and somewhat greater local relief, as much as 100 ft.

Possible Uses of the Map: This map permits a rapid evaluation of terrain suitability for specific uses. Valley bottoms, steep slopes, or flat uplands all have markedly differing potentials for land use. For example, the uplands (Units 3a, 3b, and 3c) may be suitable for building construction, but the flood plains of Unit 1a are obviously not. The map gains added utility when used in conjunction with maps of other aspects of the environment. For example, when this map is used in conjunction with the Surface Materials Map, the correlation reveals important potential problems in the combination of steep slopes with naturally unstable materials. Where the steep slopes of Unit 2d are underlain by Coastal Plain clays that swell when wet, the area is prone to disastrous landslides, especially if disturbed, as by construction. Steep slopes underlain by a deep layer of saprolite are very susceptible to erosion if they are denuded of vegetation for any reason, whether by farming or by construction. In addition, where steep slopes coincide with crystalline bedrock outcrops, rockfalls may be likely.

Reference Cited

Froelich, Albert J. and Force, L. M., 1975, Surface materials map of the Annandale quadrangle, Virginia: U.S. Geol. Survey open-file map.