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DISCUSSION

In the area underlain by crystalline rocks, the contours show a generalized configuration of the surface separating porous, relatively permeable weathered rock (saprolite) and the impermeable hard bedrock below. Control for the map is mainly from water-well data and some surface outcrop points. No attempt was made to differentiate where the saprolite is missing due to recent erosion or where the contours project above the topography where saprolite is not present on upland areas underlain by ultramafic bedrock.

The general configuration of the base of the saprolite approximately parallels the topography of the county. Inspection of the map will show the base of saprolite contours in many areas generally following the topographic contours. Hence the hills and valleys of the saprolite-bedrock interface reflect the hills and valleys of the county. The main drainage divide of the county (the topographically high area that determines to which river, the Patuxent or the South Branch of the Patapsco, the drainage waters will flow) which roughly follows U. S. 40 and Interstate 70N is also reflected by the base of the saprolite. The regional slope of this contoured surface therefore follows the regional topographic gradient. Superimposed on the regional slope of the base of saprolite surface are local domes ("highs") and closed basins ("lows").

Comparison of this map with the geologic map of the County (Cloos and Broedel, 1940) shows that many of the "highs" are coincident with areas underlain by phyllite and mafic and ultramafic rocks typically with little or no saprolite cover and that many of the "lows" are associated with schists or granitoid rocks which characteristically have a thick saprolite cover. The contours on the base of the saprolite also reflect the structural trends of the rocks and the contacts between rock types. Locally, as in the western part of the county, the general trend of the contours parallels the foliation in the rocks. A narrow belt of mafic and ultramafic rock trends north-northeast across the central part of the county. This narrow belt of rock is obviously depicted by the two north-northeast-trending closed 600-foot contour lines on the map.

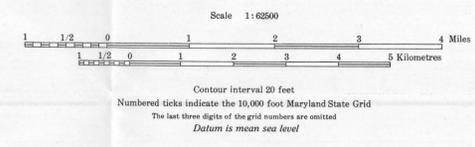
POSSIBLE USES OF THE MAP

The thickness of the saprolite may be calculated when this map is used in conjunction with the topographic map. The thickness at the points of intersection of a contour on the base of the saprolite and a topographic contour may be calculated by subtracting the contour elevation of the saprolite base from the topographic contour elevation. Also, when used with the topographic map, areas of possible ground-water emergence may be predicted. These areas are defined by the intersection of the topographic surface and the base of saprolite surface. This map used in conjunction with the geologic map (Cloos and Broedel, 1940) may help predict movement of ground water and subsurface fluid migration from septic tanks, sanitary landfills, sewage-disposal plants, and sludge pits. The foliation and cleavage direction and the different rock types shown by the geologic map may influence routes and rates of fluid migration within the saprolite. The geometry and hydrologic characteristics of different bedrock types plus the orientation of micaceous planes of weakness (foliation and cleavage) are also found to some degree in the overlying saprolite mantle and consequently affect fluid content and movement in that mantle. These fluids, after percolating through the saprolite, would tend to follow the surface separating the permeable saprolite from the impermeable bedrock below. Closed or nearly closed subsurface basins may be favorable locations for ground-water supplies from bedrock wells that utilize the storage capacity of the overlying saprolite.

This map is intended for preliminary area evaluation and the data used are considered generally reliable only at the published scale. This map should not be enlarged nor is it intended to replace detailed site investigations. Detailed studies of any one site may be different from this generalized study of a large area.

EXPLANATION

- 500 Drill hole, approximately located, showing approximate elevation in feet of base of saprolite. Estimated from driller's log or inferred from depth of water well casing. Not all wells shown
- × 680 Bedrock outcrop, showing approximate elevation in feet. Not all elevations or outcrops shown
- 550 Spring, showing approximate elevation, in feet
- Generalized contours on the base of saprolite, in feet above sea level. Contour interval 50 feet. Hachures indicate possible closed basins. Contours not differentiated where projected above land surface



CONTOUR MAP OF THE BASE OF SAPROLITE, HOWARD COUNTY, MARYLAND

By
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