DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY
DIVISION OF SCIENCE AND RESEARCH
NEW JERSEY GEOLOGICAL SURVEY

SURFICIAL GEOLOGY OF THE MARLBORO QUADRANGLE, MONMOUTH COUNTY, NEW JERSEY

by
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1992

DESCRIPTION OF MAP UNITS

Note: Unlabelled areas are outcrops of Coastal Plain formations of Miocene and older age. Surficial deposits are generally absent in these areas, although thin, discontinuous colluvium, alluvium, and eolian deposits may occur locally.

af — **ARTIFICIAL FILL**--Excavated sand, silt, clay, gravel, and man-made materials. In railroad and road embankments, dams, and landfills. As much as 20 feet thick. Many small areas of fill not mapped.

Deposits in Modern Valleys (Holocene and Pleistocene)--This suite of deposits occurs in floodplains, terraces, wetlands, and along the bases of slopes within modern valleys. The upper terrace deposits (unit Qtu) were assigned to the Cape May Formation by Salisbury and Knapp (1917). The name is not used here because the Cape May has recently been subdivided and redefined in its type area (Newell and others, 1989), and correlation of unit Qtu to the redefined Cape May deposits has not been established.

Qal — **ALLUVIUM**--Sand, silt, pebble gravel, minor clay and peat. Contains variable amounts of organic matter. Yellowish brown to dark brown in color. The sand is predominantly quartz, with variable but minor glauconite and mica. The gravel consists of quartz and some ironstone pebbles. Generally, overbank deposits of bedded sand and silt several feet thick overlie a lag or thin layer of pebble-gravel channel or bar deposits resting on the underlying Coastal Plain formation. In places, several feet of alluvial sand and silt overlie a foot or two of peat, which rests on Coastal Plain formations. Total thickness as much as 15 feet. In places, particularly in the Willow and Big Brook basins upstream from Route 34 and in the Hop Brook basin upstream from Holmdel, stream channels are entrenched as much as 10 feet into the alluvium and are eroding into the underlying formation. In these places the alluvium may no longer be accumulating.

Qs — **SWAMP DEPOSITS**--Peat, minor organic-rich silt and clay, dark brown to very dark gray in color. Maximum thickness 6 feet.

Qcal — **COLLUVIUM AND ALLUVIUM, UNDIVIDED**--Bedded alluvial sand, silt, and minor gravel, and massive colluvial sand to silty sand, in narrow, steep-walled upland valleys. Yellow to yellowish brown. Sand and gravel composition as in unit Qal. Maximum thickness 10 feet. Surface morphology consists of small aprons of colluvium sloping toward the center of the valley, and narrow, discontinuous alluvial surfaces sloping down-valley along the stream channel. In places, particularly in the Mount Pleasant Hills, modern stream channels are entrenched as much as 8 feet into these deposits, and are eroding into the underlying formations. In these places the deposit may no longer be accumulating.

Qa — **EOLIAN DEPOSITS**--Fine to medium quartz sand forming low dunes. The sand is derived from underlying formations. Reddish-yellow sand in the deposit near Pleasant Valley Crossroads is derived from the Red Bank Formation; yellow sand in the three deposits near the southern edge of the quadrangle is derived from the Kirkwood and Vincentown Formations. Maximum thickness 10 feet.

Qtl — **LOWER TERRACE DEPOSITS**--Sand and pebble gravel, minor silt and clay, forming terraces 5 to 20 feet above modern alluvial surfaces. Yellow to brownish yellow. Sand and gravel composition similar to unit Qal, but without organic matter. Maximum thickness 20 feet. Includes a deposit in an abandoned valley on the Hop Brook-Nut Swamp Brook divide north of Everett. This deposit may mark the location of a capture of Hop Brook headwaters by Nut Swamp Brook.

Qcl — **LOWER COLLUVIUM**--Massive sand and silty sand; may contain quartz and ironstone pebbles or rest on a pebble lag, forming aprons which grade distally to elevations 5 to 20 feet above modern valley bottoms. Yellow to reddish yellow. Sand and gravel composition reflects that of the Coastal Plain formations and older surficial deposits on the feeder slope. Maximum thickness 10 feet.

Qtu — **UPPER TERRACE DEPOSITS**--Sand, silt, and pebble gravel capping erosional terraces with bases at elevations of 20 to 40 feet above modern valley bottoms. Yellow to reddish yellow. Sand generally more quartzose, and less glauconitic and micaceous, than in units Qal and Qtl; gravel composition is similar to that of units Qal and Qtl. Does not contain organic matter. Maximum thickness 20 feet.

Qcu — **UPPER COLLUVIUM**--Massive sand and silty sand, may contain quartz and ironstone pebbles or rest on a pebble lag, forming aprons which rest on erosion surfaces 20 to 40 feet above modern valley bottoms. White to yellow where derived from the Cohansey Formation at the base of the Hominy Hills, yellow to reddish yellow elsewhere. Sand and gravel composition as in unit Qcl. Maximum thickness 10 feet.

Deposits on Surfaces that Predate Modern Valleys (late Miocene?-early Pleistocene?)--This suite of deposits consists of erosional remnants that cap hilltops and divide areas. The erosional surfaces on which they rest are unrelated to modern drainage and valleys. Upland gravel 1 (unit TQug1) is the Beacon Hill Formation of Salisbury (1894). In the Clarksburg Hills, 12 miles southwest of Marlboro, and in the Hominy Hills, the Beacon Hill rests on the Cohansey Sand, which is of post-middle Miocene age (Owens and Minard, 1979). Thus, the Beacon Hill is younger than middle Miocene. Upland gravel 2 (TQug2) and some of the upland colluvium (TQuc) were assigned to the Bridgeton (Woodmansie phase) and Pensauken (non-arkose phase) Formations by Salisbury and Knapp (1917), based on elevation of the deposits. Owens and Minard (1979) and Newell and others (1989) restrict the names Bridgeton and Pensauken to the deposits in the Delaware River valley, where their type locations occur. Thus, the names are not used here.

TQug2 — **UPLAND GRAVEL 2**--Sand and pebble gravel capping hilltops and interfluves 60 to 100 feet feet above modern valley bottoms. Sand is quartzose and oxidized to yellow and reddish-yellow colors; gravel is composed of quartz and some ironstone. A few deposits are weakly iron-cemented. Maximum thickness 10 feet.

TQuc — **UPLAND COLLUVIUM**--Massive sand and silty sand, may contain quartz and ironstone pebbles or rest on a pebble lag, capping gently-sloping aprons on interfluves 60 to 100 feet above modern valley bottoms. Sand and gravel composition as in unit Qcl. Maximum thickness 10 feet.

TQucg — **UPLAND COLLUVIUM AND GRAVEL, UNDIVIDED**--Coarse sand and granule and pebble gravel capping flat surfaces and aprons on lower ridgetops and interfluves in the Hominy Hills. Sand and gravel are quartzose and white to yellow; granules are angular to subangular, pebbles are rounded. Gravel fraction contains a few weathered cherts. Includes both colluvium and fluvial gravel, and, possibly, lag gravel concentrated from erosion of the underlying Cohansey Sand. Maximum thickness 10 feet.

TQug1 — **UPLAND GRAVEL 1 (BEACON HILL GRAVEL)**--Pebble gravel and sand, minor cobble gravel, capping the highest hills in the quadrangle. Occurs above an elevation of 355 feet in the Mount Pleasant Hills and above 290 feet in the Hominy Hills. Sand is quartzose, reddish yellow to yellow; gravel is predominantly quartz but includes a little weathered chert and mudstone. Deposit is locally iron-cemented in the Mount Pleasant Hills. Maximum thickness 10 feet.

MAP SYMBOLS

Contact--Solid where sharply defined by slope breaks, dashed where approximately located, short-dashed where feathering or gradational, dotted where concealed or excavated.

Shallow topographic basin--Line marks rim of basin, dot marks bottom of basin. Height of closure generally less than 6 feet. Of possible periglacial origin.

Crest of dune ridge

Lag of pebbles from unit TQug2--On surface of underlying Coastal Plain formation.

Lag of pebbles from unit TQug1--On surface of underlying Coastal Plain formation.

Excavation scarp--Line at top of scarps, ticks on slope.

I-16,046 2620 ± 80 BP — **Site of radiocarbon-dated peat**--With laboratory number and age. Sample I-16,046 provided by P.J. Sugarman, N.J. Geological Survey (written communication, 1990).

REFERENCES

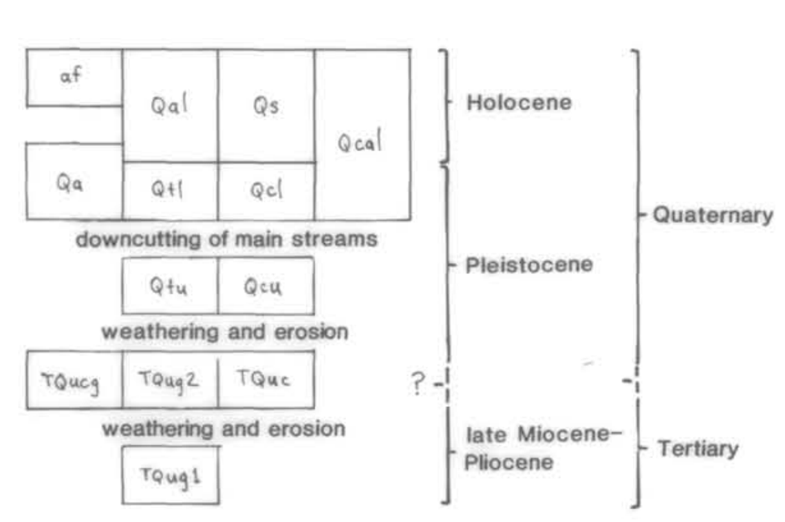
Newell, W. L., Wyckoff, J. S., Owens, J. P., and Farnsworth, John, 1989, Cenozoic geology and geomorphology of southern New Jersey Coastal Plain: U. S. Geological Survey Open-File Report 89-0159, 51 p.

Owens, J. P., and Minard, J. P., 1979, Upper Cenozoic sediments of the lower Delaware valley and the northern Delmarva Peninsula, New Jersey, Pennsylvania, Delaware, and Maryland: U. S. Geological Survey Professional Paper 1067-D, 47 p.

Salisbury, R. D., 1894, Surface geology: report of progress: N.J. Geological Survey Annual Report for 1893, p. 35-328.

Salisbury, R. D., and Knapp, G. N., 1917, The Quaternary formations of southern New Jersey: N. J. Geological Survey Final Report of the State Geologist, v. 8, 218 p.

Correlation of Map Units



Base from U. S. Geological Survey, 1954
Photorevised 1981

SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Geology mapped in 1990

The interpretations presented here are provisional pending peer review. There may be revisions prior to publication.