DELAWARE GEOLOGICAL SURVEY UNIVERSITY OF DELAWARE, NEWARK DELAWARE GEOLOGICAL SURVEY Robert R. Jordan, State Geologist GEOHYDROLOGY OF THE NEWARK AREA NEWARK EAST, NEWARK WEST QUADRANGLES HYDROLOGIC MAP SERIES, NO. 2 SHEET 2—HYDROLOGIC DATA MAP KEY RECORDING STREAM GAGE GROUND-WATER QUALITY DRAINAGE AREA: sq. miles PARTIAL RECORD STREAM GAGE N = negligible U.S.G.S. Gage No. DRAINAGE AREA: sq. miles sq. km. DAM (Water Supply) ↑ Surface Area, NORMAL WATER TREATMENT PLANT CAPACITY ACRE-FEET Capacity, MGD City of Newark/Univ. of Delaware "Laird Tract Well Field" (Ca45-20, 21) 23) O OBSERVATION WELL Q : COLUMBIA Fm. Probable safe yield about 400 gpm. O Cb32-9, Wg RO OBSERVATION WELL WITH RECORDER Kp : POTOMAC Fm. O Cb32-8, Wg PRODUCTION WELL, PUBLIC SUPPLY Wg : WISSAHICKON Fm. I IRRIGATION WELL Cm : COCKEYSVILLE Fm. SPRING Db15-5 : WELL NUMBER LANDFILL, ABANDONED A : ABANDONED O Cb41-11, Wg O Cb 41-3, Wg Ca45-39, Wg OR average, 1941-70 minimum, 1969-77 Source: National Weather Service Monthly Distribution of Rainfall at Newark Probable sate yield based on present O Db12-27, O Kp (?) well construction and pumping conditions approx. 850 apm (1.2 mgd). (1) Db12-41, Kp land surface = 77' above mean sea level 1972 1974 Water Levels in Obs. Well Db24-10, Columbia Formation ● Dc22-18, Kp 40.6 105.6 80.4 1 datum = 79' above mean sea level Dc31-14, O Dc31-13, O, R Dc31-10, Kp ●0 .Dc31-9ea0 450 gpm (0.65 mgd). (2) Water Levels in Obs. Well Ca45-39, Wissahickon Formation GEOHYDROLOGY OF THE NEWARK AREA, DELAWARE (1) Safe Yield: defined as the pumping rate which lowers water levels to the top of Kenneth D. Woodruff the highest well screen in the well field. 1978 (2) Includes pumping wells immediately to the south, outside of map area. SCALE 1:24000 UTM GRID AND 1970 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET QUADRANGLE LOCATION 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET Base maps - USGS Topographic Division, Newark East, Newark West Quadrangles. 1 .5 0 1 CONTOUR INTERVAL 10 AND 20 FEET (APPROX. 3 METERS AND 6 METERS)

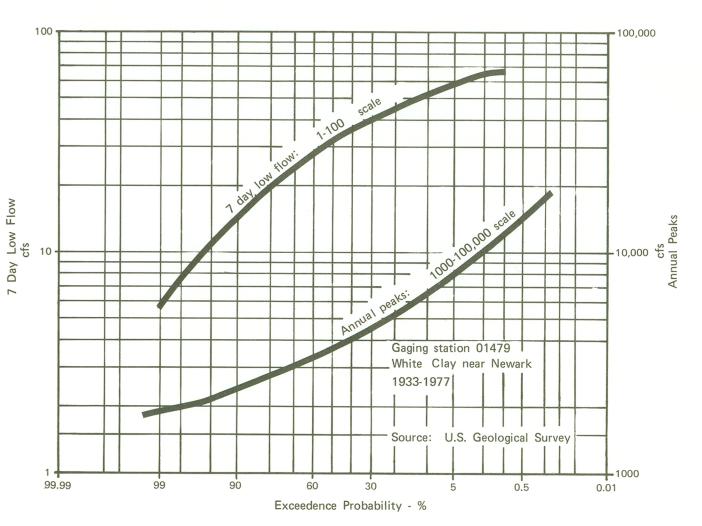
## DISCUSSION

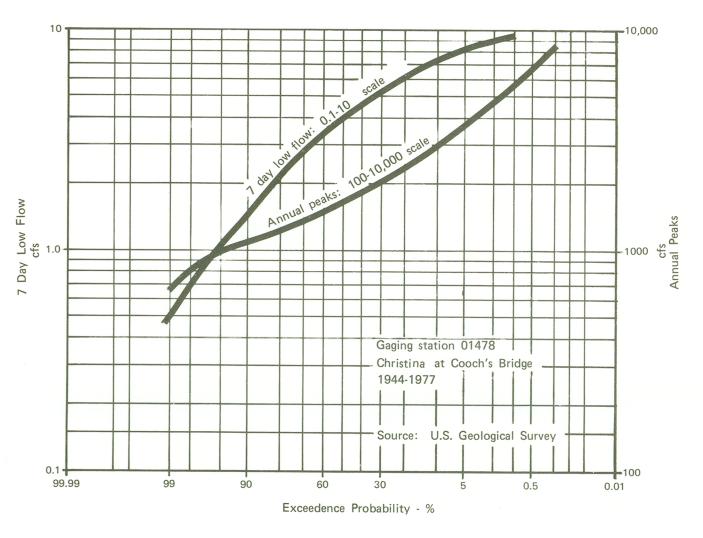
This publication is a companion map to Geohydrology of the Newark Area, Sheet 1, Basic Geology (Woodruff, 1977) and presents information on water supply and quality for the Greater Newark Area. Ground water is the main source of both public and private water supplies within the map area. The City of Newark is the principal user of water with an average daily use of about 3.4 mgd in 1978. Of this amount, 2.5 mgd was ground water pumped from local well fields. The remainder was surface water supplied through an interconnection with a private water company.

Ground water in both the water-table aquifer and deeper artesian aquifers usually is acidic (pH approximately 5.5 to 7.0) and is low in total dissolved solids. However, high iron content (up to several parts per million) is a common problem in both Coastal Plain and Piedmont wells. Fluoride concentrations as high as 0.2 milligrams per liter occur in Piedmont wells and such concentrations should be considered in designing treatment facilities (Talley and Hahn, 1978). Measured water levels in Coastal Plain wells indicate that the Columbia Formation and sands of the Potomac Formation act as a single leaky system in the central portion of the map area. Levels under present pumping conditions may average about 45 to 50 feet below land surface at the center of the Newark "South Well Field."

In the southeast portion of the map area total sediment thickness is about 400 feet and sands appear to be separated hydrologically. (See cross section I-H, Sheet 1).

Ground-water in the Piedmont rocks usually occurs in fracture zones often associated with pegmatites. Most of the water first pumped from such fracture zones appears to come from storage and continued pumpage at high rates may deplete such zones faster than they can be recharged. Therefore initial pumping tests on Piedmont wells may not accurately indicate the optimum long-term pumping rates.





## SELECTED REFERENCES

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