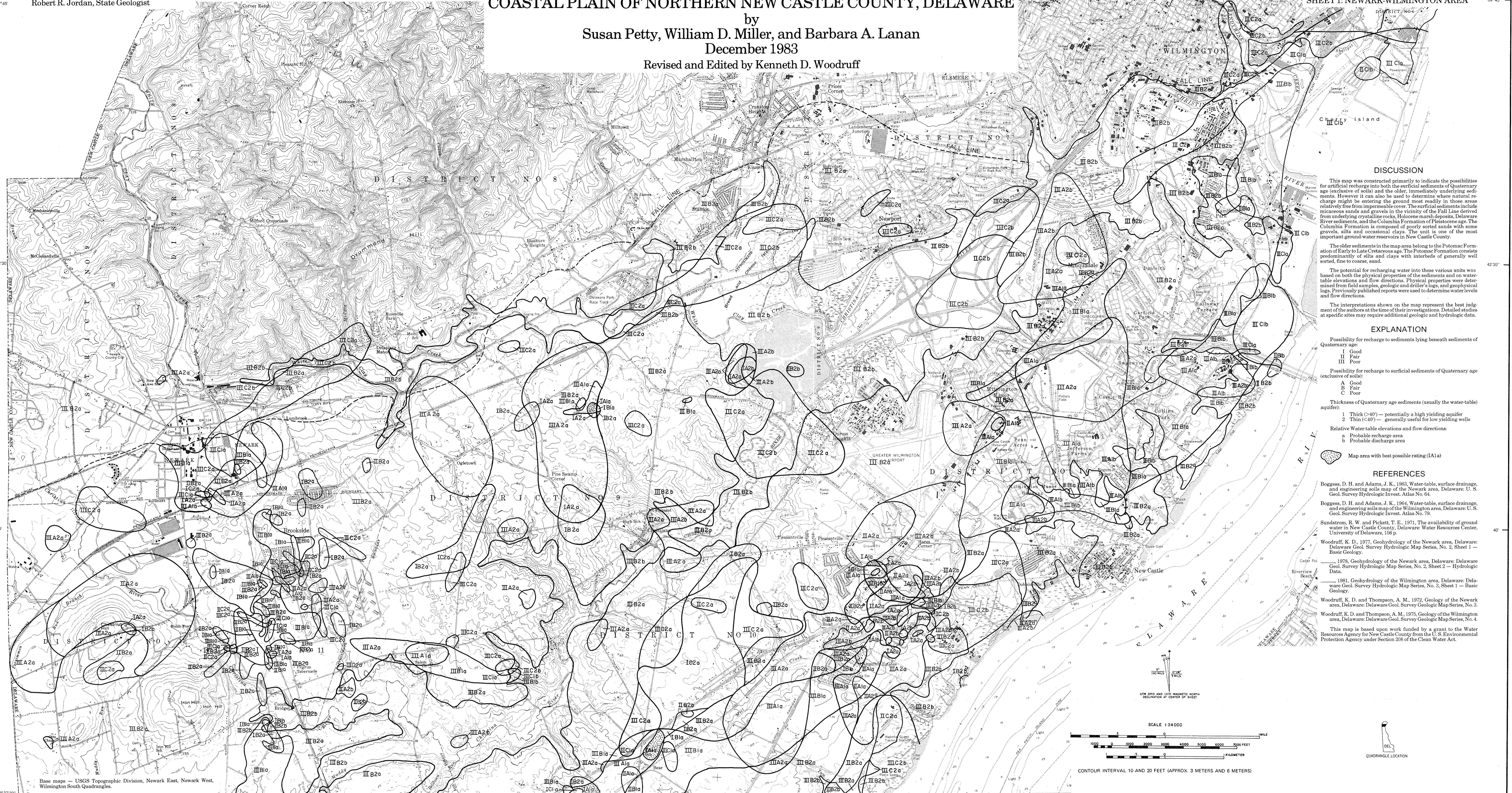


POTENTIAL FOR GROUND-WATER RECHARGE IN THE COASTAL PLAIN OF NORTHERN NEW CASTLE COUNTY, DELAWARE

by
Susan Petty, William D. Miller, and Barbara A. Lanan
December 1983

Revised and Edited by Kenneth D. Woodruff



DISCUSSION

This map was constructed primarily to indicate the possibilities for artificial recharge into both the surficial sediments of Quaternary age (exclusive of soils) and the older, immediately underlying sediments. However it can also be used to determine where natural recharge might be entering the ground most readily in those areas relatively free from impermeable cover. The surficial sediments include micaceous sands and gravels in the vicinity of the Fall Line derived from underlying crystalline rocks, Holocene marsh deposits, Delaware River sediments, and the Columbia Formation of Tertiary age. The Columbia Formation is composed of poorly sorted sands with some gravels, silts and occasional clays. The unit is one of the most important ground-water reservoirs in New Castle County.

The older sediments in the map area belong to the Potomac Formation of Early to Late Cretaceous age. The Potomac Formation consists predominantly of silts and clays with interbeds of generally well sorted, fine to coarse, sand.

The potential for recharging water into these various units was based on both the physical properties of the sediments and on water-table elevations and flow directions. Physical properties were determined from field samples, geologic and driller's logs, and geophysical logs. Previously published reports were used to determine water levels and flow directions.

The interpretations shown on the map represent the best judgment of the authors at the time of their investigations. Detailed studies at specific sites may require additional geologic and hydrologic data.

EXPLANATION

- Possibility for recharge to sediments lying beneath sediments of Quaternary age:
- I Good
 - II Fair
 - III Poor
- Possibility for recharge to surficial sediments of Quaternary age (exclusive of soils):
- A Good
 - B Fair
 - C Poor
- Thickness of Quaternary age sediments (usually the water-table aquifer):
- 1 Thick (>40') — potentially a high yielding aquifer
 - 2 Thin (<40') — generally useful for low yielding wells
- Relative Water-table elevations and flow directions:
- a Probable recharge area
 - b Probable discharge area
- Map area with best possible rating (IIA1a)

REFERENCES

- Bogges, D. H. and Adams, J. K., 1963, Water-table, surface drainage, and engineering soils map of the Newark area, Delaware: U. S. Geol. Survey Hydrologic Invest. Atlas No. 64.
- Bogges, D. H. and Adams, J. K., 1964, Water-table, surface drainage, and engineering soils map of the Wilmington area, Delaware: U. S. Geol. Survey Hydrologic Invest. Atlas No. 79.
- Sundstrom, R. W. and Pickett, T. E., 1971, The availability of ground water in New Castle County, Delaware: Water Resources Center, University of Delaware, 159 p.
- Woodruff, K. D., 1977, Geohydrology of the Newark area, Delaware: Delaware Geol. Survey Hydrologic Map Series, No. 2, Sheet 1 — Basic Geology.
- , 1978, Geohydrology of the Newark area, Delaware: Delaware Geol. Survey Hydrologic Map Series, No. 2, Sheet 2 — Hydrologic Data.
- , 1981, Geohydrology of the Wilmington area, Delaware: Delaware Geol. Survey Hydrologic Map Series, No. 3, Sheet 1 — Basic Geology.
- Woodruff, K. D. and Thompson, A. M., 1972, Geology of the Newark area, Delaware: Delaware Geol. Survey Geologic Map Series, No. 3.
- Woodruff, K. D. and Thompson, A. M., 1975, Geology of the Wilmington area, Delaware: Delaware Geol. Survey Geologic Map Series, No. 4.
- This map is based upon work funded by a grant to the Water Resources Agency for New Castle County from the U. S. Environmental Protection Agency under Section 208 of the Clean Water Act.