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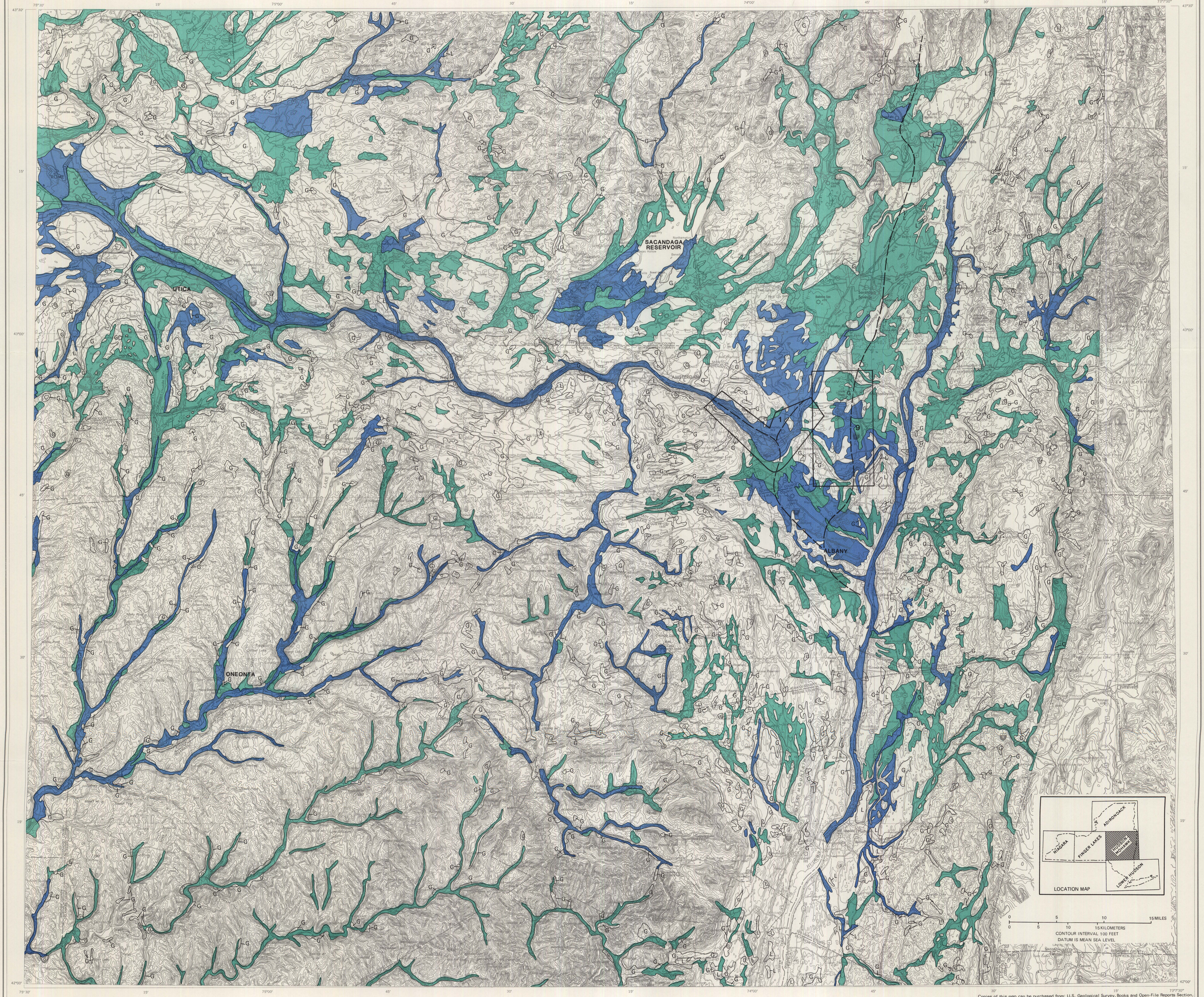
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER-RESOURCES INVESTIGATIONS REPORT 87-4275
HUDSON - MOHAWK SHEET



Base from U.S. Army Map Service, 1:250,000 scale

Copies of this map can be purchased from: U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225

POTENTIAL YIELDS OF WELLS IN UNCONSOLIDATED AQUIFERS IN UPSTATE NEW YORK--HUDSON-MOHAWK SHEET

By
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INTRODUCTION

New York State's increasing need to develop ground-water-protection and management policies has led to an effort to identify and delineate the location and extent of its significant aquifers--those that consist of sand and gravel and yield substantial amounts of water to wells. Bedrock aquifers, although significant sources of water in some areas, are not addressed here.

A review of several maps and reports on the ground-water resources of New York State counties and river basins that were prepared from the 1930's through the mid-1960's by the U.S. Geological Survey, in cooperation with the New York State Department of Environmental Conservation, revealed that the maps were inconsistent in scale, format, and amount of detail. The only two statewide maps that show aquifers are Heath (1964) at 1:1,000,000 scale, and Kantrowitz and Snavely (1982) at 1:750,000 scale; both have insufficient detail for use in the development of aquifer-protection plans.

In the mid-1980's, the U.S. Geological Survey, in cooperation with the New York State Department of Environmental Conservation, compiled a set of five maps showing at uniform scale the locations and potential well yields of the unconsolidated aquifers in upstate New York (excluding Long Island). The maps also indicate parts of aquifers that are heavily used by community water systems and that have been designated "Primary Water-Supply Aquifers" by the State.

Purpose and Scope

This map is one in a set of five that shows unconsolidated aquifers in New York State excluding Long Island. These maps delineate unconsolidated aquifers at a scale of 1:250,000, are based on the most recent information available, and use the same symbols to identify unconsolidated aquifers and potential well-yield ranges.

The Primary aquifers, most of which were mapped in detail by the Geological Survey in the late 1970's and early 1980's, are outlined and keyed by number to the corresponding published references. The small map to the right identifies the major river basins and indicates other areas that are described in the ground-water reports that were used in this data compilation.

The scale of 1:250,000 was selected for this map series because it is the one used by the New York State Geological Survey for its bedrock geology map (Fisher and others, 1970) and its surficial geology map of the Hudson-Mohawk area (Cadwell and others, 1986). Together these maps form a consistent set of geologic and ground-water maps for use in regional management of the ground-water resources of the State.

These maps indicate only the general location of the unconsolidated aquifers; they are not intended for detailed site evaluations. Additional information that may be needed for site evaluation is given in the reports cited in the list of related publications. Determination of the precise location of aquifer boundaries or of well yields may require additional data.

Ground water may be obtained from unconsolidated aquifers that are too small to be shown at this scale and also from till, from buried unconsolidated aquifers not yet identified, and from underlying bedrock. Wells that have an adequate yield for domestic use (up to 10 gallons per minute) can be constructed almost anywhere within the mapped area. In some areas, bedrock aquifers are significant sources of water and warrant consideration in any appraisal of ground-water conditions. Several reports cited in the list of related publications include information on bedrock aquifers.

ACKNOWLEDGMENTS

The New York State Geological Survey provided a map of the surficial geology of the Hudson-Mohawk area for use in delineating aquifer boundaries (Cadwell and others, 1986).

WELL YIELDS

Since the mid-1940's, the U.S. Geological Survey, in cooperation with many State and local government agencies, has mapped and appraised several aquifer systems in New York. The locations of the unconsolidated aquifers and the ranges of potential well yields shown here were compiled from information given in several publications and from well-yield data from the U.S. Geological Survey's computerized Ground Water Site Inventory data base. Aquifer boundaries were derived from hydrogeologic and surficial geology maps, numerous well records, and interpretation of topographic maps.

The well-yield ranges represent the potential yields that may be obtained from properly constructed wells screened and developed in the aquifer. The given values may not represent sustained withdrawals from the deposit but, rather, the potential short-term withdrawal. Yields shown for many areas are based on aquifer-test and well-capacity-test data and on yields reported by drillers and homeowners. Yields in some areas are estimates based on geologic logs, saturated thickness, and hydraulic conductivity. Actual yields may differ slightly from those indicated.

Some aquifers are in areas from which data on wells or hydraulic properties were insufficient to determine the range of yields. Those that consist of coarse, granular material are assigned a yield of 10 to 100 gallons per minute (light green).

The blue shading represents unconsolidated water-table aquifers from which high well yields can be obtained. These aquifers are recharged rapidly by water percolating through the permeable overlying material.

Uncolored areas with letter designations are underlain by till, lake clay, silt and silty sand, sand and gravel, or bedrock. Some sand and gravel aquifers may be present that are too small to plot at this scale. Wells dug in till or drilled in bedrock are generally capable of yielding 1 to 10 gallons per minute. Larger yields are available from some bedrock units such as limestone and highly fractured shale.

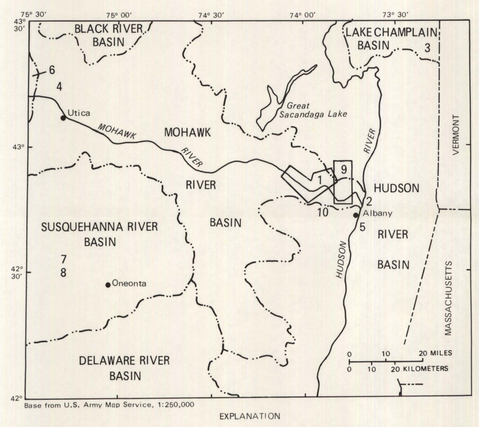
REFERENCES CITED

Cadwell, D. H., and others, 1986, Surficial geologic map of New York, Hudson-Mohawk sheet: New York State Museum and Science Service Map and Chart Series no. 40, scale 1:250,000.

Fisher, D. W., Isachsen, Y. W., and Rickard, L. V., 1971, Geologic map of New York: New York State Museum and Science Service Map and Chart Series No. 15, 6 sheets, scale 1:250,000.

Heath, R. C., 1964, Ground water in New York: New York State Water Resources Commission Bulletin GW-51, 1 sheet, scale 1:1,000,000.

Kantrowitz, I. H. and Snavely, D. S., 1982, Availability of ground water from aquifers in upstate New York: U.S. Geological Survey Open-File Report 82-437, 2 sheets, scale 1:750,000.



Base from U.S. Army Map Service, 1:250,000

EXPLANATION

DRAINAGE-BASIN DIVIDE

5 REFERENCE NUMBER- Indicates river basins and aquifer areas about which ground-water reports have been published. Numbers refer to related publications listed below. Outlined numbers represent primary aquifers

Drainage areas and reference numbers.

RELATED PUBLICATIONS

(Numbers at left correspond to numbers on main map and on small map above.)

1. Brown, G. A., Moore, R. B., Mhon, K. I., and Allen, R. V., 1981, Geohydrology of the valley-fill aquifer in the Schenectady area, Schenectady County, New York: U.S. Geological Survey Open-File Report 82-84, 6 sheets, scale 1:24,000.

2. Dineen, R. J., and Hanson, E. L., 1983, Bedrock topography and glacial deposits of the Colonie Channel between Saratoga Lake and Coeymans, New York: New York State Museum Map and Chart Series 37, 56 p., 4 plates, scale 1:48,000

3. Giese, G. L., and Hobba, W. A., 1970, Water resources of the Champlain-upper Hudson basins in New York State: New York State Conservation Department, Division of Water Resources, 153 p., 2 plates, scale 1:250,000

4. Halberg, N. H., Hunt, O. P., and Pauszek, F. H., 1962, Water resources of the Utica-Rome area, New York: U.S. Geological Survey Water Supply paper 1499-C, 46 p., 4 plates, scale 1:125,000.

5. Halberg, N. H., Hunt, O. P., and Pauszek, F. H., 1964, Water resources of the Albany-Schenectady-Troy area, New York: U.S. Geological Survey Water Supply Paper 1499-D, 64 p.

6. Kantrowitz, I. H., 1970, Ground-water resources in the eastern Oswego River basin, New York: New York State Water Resources Commission Basin Planning Report ORB-2, 129 p.

7. MacNish, R. D., and Randall, A. D., 1982, Stratified-drift aquifers in the Susquehanna River basin, New York: New York State Department of Environmental Conservation Bulletin 75, 68 p.

8. Randall, A. D., 1972, Records of wells and test borings in the Susquehanna River basin, New York: New York State Department of Environmental Conservtion Bulletin 69, 92 p.

9. Reynolds, R. J., 1985, Hydrogeology of the Clifton Park area, Saratoga County, New York: U.S. Geological Survey Water Resources Investigations Report 84-4032, 6 sheets, scale 1:24,000.

10. Snavely, D. S., 1983, Ground-water appraisal of the Pine Bush area, Albany, New York: U.S. Geological Survey Water Resources Investigation Report 82-4000, 47 p.

EXPLANATION

POTENTIAL YIELD OF WATER TO WELLS IN UNCONSOLIDATED AQUIFERS

UNCONFINED AQUIFERS, 10 to 100 GALLONS PER MINUTE--Sand and gravel with saturated zone generally less than 10 ft thick, or thicker but with less permeable silty sand and gravel. Yields in areas adjacent to streams may exceed 100 gal/min through pumping-induced infiltration, but these areas are too small to show at this scale.

UNCONFINED AQUIFERS, MORE THAN 100 GALLONS PER MINUTE--Sand and gravel of high transmissivity and with saturated thickness greater than 10 ft. Many such areas are associated with surface-water sources that can provide additional water pumping-induced recharge.

AQUIFER OF UNKNOWN POTENTIAL--Areas of sand or sand and gravel for which little or no well data are on file to determine yield potential. Letter symbols, explained below, indicate the type of deposit.

L — Lacustrine or eolian--Fine to medium sand that probably yields less than 10 gal/min.

G — Kame, kame terrace, kame moraine, outwash, or alluvium--Sand and gravel of unknown thickness or saturation. Yield potential is greater where streams are present.

BURIED CHANNEL--Stratified drift of unknown saturated thickness and yield potential and overlain by other unconsolidated deposits.

1 — PRIMARY WATER-SUPPLY AQUIFER--A highly productive aquifer that is being used as a source of water supply by major public-supply systems. Number indicates name of aquifer area (see key below) and report number in list of related publications. Reports and maps cited describe these aquifers in detail.

Primary aquifer number	Aquifer area
1	Schenectady
9	Clifton Park - Halfmoon area