PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

INTRODUCTION

Upstate New York (excluding Long Island) derives 36 percent of its water supply from ground water (New York State Department of Health, 1981). Most of the aquifers that supply this water are unconsolidated glacial and alluvial deposits that partly fill major bedrock valleys and their tributaries. Ground water in these aquifers is under either water-table (unconfined) or artesian (confined) conditions.

The land surface above such aquifers is relatively level and thus forms an ideal location for cities, towns, industries, and agricultural operations. Such development over highly permeable aquifer material, coupled with a generally shallow water table, makes these aquifers susceptible to contamination from point sources such as landfills, road-salt stockpiles, fuel-storage facilities, septic-tank leachate, and industrial facilities that have a potential for contaminant leakage. In addition, contamination from urban and agricultural runoff and other nonpoint sources can adversely affect ground-water quality over large areas.

Management decisions by State and local water agencies concerned with present or potential contamination of ground water require detailed knowledge of the hydrogeology of these stratified drift aquifers. In 1980, the U.S. Geological Survey, in cooperation with the New York State Department of Health, began a study to define the hydrogeology of selected extensively used aquifers in upstate New York. Of these aquifers, 15 have been studied and the results published in individual reports at 1:24,000 scale; 11 are summarized at a reduced scale by Waller and Finch (1982), and four others were summarized by Cosner (1984). As a continuation of this effort, the U.S. Geological Survey, in cooperation with the New York State Department of Environmental Conservation, began a study in 1983 to investigate the hydrogeology of several other extensively used aquifers. Each report resulting from this study consists of a set of 1:24,000-scale maps and geologic sections that depict the hydrogeology of the aquifer, including well locations, bedrock topography, surficial geology, soil permeability, water-table altitude, saturated thickness of unconsolidated deposits, and land use.

This map set summarizes the hydrogeology of the unconsolidated aquifer system in the western part of the Utica area. It consists of eight sheets, compiled from available hydrogeologic data, that depict location of wells and test holes (sheet 1), surficial geology (sheet 2), geologic sections (sheet 3), water-table altitude (sheet 4), generalized bedrock topography (sheet 5), saturated thickness of unconsolidated deposits (sheet 6), generalized soil permeability (sheet 7), and land use (sheet 8). A companion set presents similar information for the eastern part of the Utica area at the same scale (Casey and Reynolds, 1989). The stratified-drift aquifer system depicted here is in southeastern Oneida County, in east-central New York. The stratified-drift aquifer system underlies the Mohawk River and parts of Oriskany, Saquoit, and Mud Creeks.

LOCATION OF WELLS AND TEST HOLES

This map shows the locations of wells and test holes from which hydrogeologic data were obtained. These data are on file at the U.S. Geological Survey office in Albany, N.Y., either as published reports (mainly Halberg and others, 1962), as unpublished well data, or stored in the U.S. Geological Survey's Ground Water Site Inventory data base.

REFERENCES CITED

New York State Department of Health, 1981, Report on ground-water dependence in New York State: New York State Department of Health Report, 99 p.

Waller, R. M. and Finch, A. J., 1982, Atlas of eleven selected aquifers in New York: U.S. Geological Survey Water Resources Investigations 82-553, 255 p.

Halberg, H. N., 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.

Cosner, O. J., 1984, Atlas of four selected aquifers in New York: U.S. Environmental Protection Agency, Water Management Divison, Contract 68-01-6389, 101 p.

Casey, G. D., Reynolds, R. J., 1989, Hydrogeology of stratified-drift aquifers in the Utica area, Oneida and Herkimer Counties, New York, part 2 (east): U.S. Geological Survey Water Resources Investigations Report 88-4195, 8 sheets, 1:24,000 scale.

EXPLANATION

Wells and test holes are identified by a sequential county well number (local identifier) assigned by the U.S. Geological Survey. These numbers consist of a prefix that identifies the county in which the well is located, in this case "Oe" for Oneida County, followed by the sequential well number. For brevity, the prefix is omitted.

1321 1514000	PUBLIC-SUPPLY WELL--Large-capacity wells serving municipal water-supply systems. Upper number is county well number assigned by the U.S. Geological Survey. Public-supply wells are further identified with an eight-digit community water-supply number assigned by the New York State Department of Health.
83	DOMESTIC WELL--Well terminating in unconsolidated material that supplies an individual residence. Number is county well number.
84	DOMESTIC WELL-- Well that terminates in bedrock and supplies an individual residence. Number is county well number.
192	DOMESTIC WELL THAT TAPS UNSPECIFIED SOURCE--No data to confirm whether well taps unconsolidated material or bedrock. Number is county well number.
1320	TEST HOLE--Test hole or boring that was drilled to determine local subsurface characteristics for construction projects or for development of water supply-wells. Number is county well number.
	AQUIFER BOUNDARY--Approximate boundary of stratified-drift aquifer, defined as the contact between valley-fill sediments and bedrock valley wall or upland till deposits. Dashed where inferred.
A——A'	TRACE OF GEOLOGIC SECTION--Geologic sections are shown on sheet 3.

Base from New York State Department of Transportation
Clinton, 1978, Oriskany, 1978, Rome, 1978, and Utica West, 1978, NY, 1:24,000 scale

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds
1988
Sheet 1. Location of Wells and Test Holes

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER-RESOURCES INVESTIGATIONS REPORT 88-4194
SHEET 2: SURFICIAL GEOLOGY

SURFICIAL GEOLOGY

The Mohawk River valley contains glacial deposits of Wisconsin age that consist of outwash sand and gravel; lacustrine silt, sand, and clay; ice-contact deposits of kame sand, silt, gravel; and recent alluvium of silt, sand, and gravel (Wright, 1972; Ridge, 1985).

Deglaciation Chronology

The study area was covered by the Ontario Lobe of glacial ice until the end of the late Wisconsin glaciation. As the ice receded, two glacial sublobes--the Oneida and the Mohawk--formed in the Mohawk valley. The Oneida sublobe retreated to the west, while the Mohawk sublobe retreated to the east. A proglacial lake formed between the retreating ice lobes and the northern margin of the Appalachian Plateau (to the south) which resulted in the deposition of fine-grained lacustrine sediments. As the Oneida sublobe retreated westward, the Mohawk sublobe readvanced westward during the West Canada readvance (Ridge, 1985) and deposited a layer of till. The maximum extent of this readvance is placed west of Rome, where the advancing Mohawk sublobe came in contact with the receding Oneida sublobe (Ridge, 1985). The subsequent eastward recession of the Mohawk sublobe resulted in the formation of another proglacial lake in the Mohawk valley that later drained to the south through a col near Cedarville. The deposits associated with this glacial retreat consist of a sequence of lacustrine sand, silt, and clay interbedded with till. Localized submerged fan deposits of boulder and cobble gravel, muddy gravel, and fine-to-medium sand also formed in some places (Ridge, 1985).

The Mohawk sublobe deposited a layer of till during its subsequent westward Salisbury readvance (Muller, Franzi, and Ridge, 1984). The maximum westward limit of this advance lies between Frankfort and Utica. As the Mohawk sublobe thereafter retreated eastward the Oneida sublobe also moved eastward. This readvance, known as the Indian Castle readvance (Wright, 1972), was investigated and redefined by Ridge (1985), who identified it as two separate readvances. The Hinkley readvance, followed by the Barneveld readvance, both left sheets of till in the mapped area. Silt, clay, sand, and gravel were deposited in the proglacial lake that formed between the ice fronts and the Appalacian Escarpment during the period between these readvances.

As the ice of the Barneveld readvance was dissipating, tongues of ice remained in the Saquoit Creek and Oriskany Creek valleys. As ablation continued west of Utica, small kame moraines and ice-contact deposits developed against stagnant ice in the Clinton - New Hartford and Clark Mills - Oriskany areas. These features represent two stillstands or minor readvances of the ice front during deglaciation (Wright, 1972). The "Clinton - New Hartford Moraine" (Wright, 1972) is a discontinuous feature between Clinton and Utica that consists of till and ice-contact sand and gravel. This moraine temporarily blocked the lower reaches of Saquoit Creek and diverted glacial meltwater to the east-trending Mud Creek through-valley southwest of Utica. As the ice front retreated from the moraine, meltwater flowed through the present-day Mud Creek and Saquoit Creek valleys and escaped eastward into the Mohawk Valley (Wright, 1972). Deposition of the "Clark Mills-Oriskany Moraine" (Wright, 1972) suggests a period of continued stagnation of the ice lobe. Till could have formed amid outwash and ice-contact deposits within the valley only if ice had remained in the Oriskany Creek valley. The large east-west through-valleys near Clark Mills and Kirkland indicate meltwater flow into Saquoit Creek, which suggests that ice remained in the lower reach of the Oriskany Creek valley (Wright, 1972) during the final stages of deglaciation.

The valley sediments between Clinton and Oriskany consist mainly of reworked outwash and lacustrine material. The westward retreat of the Ontario lobe produced no other moraines in the immediate area. The lacustrine sand, silt, and clay that lie in the Mohawk River valley today were deposited in proglacial Lake Amsterdam as the Oneida lobe of the Indian Castle ice sheet retreated westward (Lowey, 1983).

The Ontario sublobe's southwestward advance prior to final deglaciation is referred to as the Stanwix re-advance. During this time, the ice advanced to within 1 or possibly 2 miles east of Rome (Wright, 1972), where it deposited a moraine. As the ice melted, a proglacial lake formed west of the moraine. Lake Iroquois, as referred to by Fairchild (1921), drained into the Iromohawk River, which followed the post-Indian Castle-Great Lakes drainage channel.

SELECTED REFERENCES

Brigham, A. P., 1929, Glacial geology and geomorphic conditions of the lower Mohawk valley: New York State Museum and Science Service, Bulletin 280, 133 p.

Fairchild, H. L., 1912, Glacial waters in the Black and Mohawk valleys: New York State Museum and Science Service, Bulletin 160, 47 p.

Forest, R. J., 1983, Macrofabrics, microfabrics, and microstructures of till and Pleistocene geology of the Ilion Quadrangle, Mohawk Valley, New York: Syracuse University, Master's dissertation, 79 p.

Fullerton, D. S., 1971, The Indian Castle glacial readvance in the Mohawk Lowland, New York, and its regional implications: Princeton University, Ph.D dissertation, 96 p.

Halberg, N. N., and others, 1962, Water resources of the Utica-Rome area, New York: U.S. Geological Survey Water-Supply Paper 1499c, 46 p.

Kay, Marshall, 1953, Geology of the Utica Quadrangle, New York: New York State Museum and Science Service, Bulletin 347, 126 p.

Lowey, J. M., 1983, The Pleistocene geology of the Oriskany, New York 7.5-minute quadrangle: Syracuse University, Master's dissertation, 67 p., 1 map, scale 1:24,000.

Lykens, C. A., 1983, The maximum extent of Oneida Lobe Ice within the western Mohawk valley, within the Port Bruce Stadial--A reevaluation: Syracuse University, Master's dissertation, 84 p.

Mueller, E. H., Franzi, D. A., Ridge, J. C., 1984, The late Wisconsinan glaciation of the West Canada Creek valley, in Potter, D. B., (ed.) Guidebook, New York State Geological Association, 56th Annual Meeting, Hamilton, N.Y.: 352 p.

Ridge, J. C., 1985, The Quaternary glacial and Paleomagnetic record of the West Canada Creek and western Mohawk valleys of central New York: Syracuse University, Ph.D dissertation, 253 p.

Reynolds, R. J., 1989, Availability of ground water from unconsolidated deposits in the Mohawk River valley: U.S. Geological Survey Water Resources Investigations Report 88-4091; 9 sheets, scale 1:125,000 (in press).

Whipple, J. M., 1969, Surficial geologic maps of the Clinton, Utica West, Oriskany, and Rome quadrangles: Unpublished data on file in Albany, N.Y., Office of the U.S. Geological Survey, 34 sheets, scale 1:24,000.

Wright, F. W. III, 1972, The Pleistocene and Recent geology of the Oneida-Rome District, New York: Syracuse University, Ph.D dissertation, 192 p.

EXPLANATION

al ALLUVIUM--Postglacial alluvial deposits of silt, fine sand, and some gravel within river and stream flood plains. In larger valleys that are subject to frequent flooding, may be overlain by silt of variable thickness. Alluvium is moderate to poorly permeable, but is generally underlain by more permeable outwash deposits. Thickness variable but generally less than 30 feet.

alf ALLUVIAL FAN--Fan-shaped alluvial deposits of poorly stratified silt, sand, and gravel at the foot of steep slopes. Moderate to poorly permeable.

alt ALLUVIAL TERRACE--Postglacial alluvial deposits of silt, fine sand, and some gravel in terraces above the flood plain. Formed by downcutting of the river or stream through postglacial alluvium. Moderate to poorly permeable.

pm SWAMP DEPOSITS--Postglacial deposits of peat, muck, organic silt, and sand in poorly drained areas and localized depressions. May overlie marl and lake silt. Thickness generally less than 60 feet. Poorly permeable.

ls LACUSTRINE SAND--Sand, well sorted, stratified, fluvially deposited into a proglacial or postglacial lake in a nearshore, shallow-water environment. Variable thickness, permeable.

og OUTWASH SAND AND GRAVEL--Stratified sand and gravel deposited by meltwater streams as valley train or as outwash plains and terraces. Highly permeable, well-sorted, coarse to fine gravel with sand. Generally becomes finer-grained as distance from ice border increases. Variable thickness.

k KAME DEPOSITS--Include kames, eskers, kame terraces, and kame deltas. Ice-contact sand and gravel deposits consisting of fluvially sorted coarse to fine sand and gravel. Extreme variability in sorting, grain size, and thickness of individual beds. May be locally cemented with calcium carbonate. Variable thickness and permeability; permeability generally high in coarser, more well-sorted beds.

km KAME MORAINE--Poorly sorted ice-contact deposits, primarily of sand and gravel, but also containing large amounts of silt, clay and boulders. Generally composed of the slumped remnants of a formerly continuous outwash plain built on the foot of a rapidly wasting or stagnant ice front. Indicates a temporary stillstand of the ice front during deglaciation. Thickness and content variable. Locally cemented by calcium carbonate. Permeability variable but generally high in coarser, more well-sorted material.

t TILL--Ice-contact deposits; unstratified, unsorted mixture of clay, silt, sand, gravel, and boulders. Relatively impermeable with moderate to high clay content. Thickness variable (up to 150 feet) but generally less than 20 feet in upland areas.

ta ABLATION TILL--A moraine or sheet of till that was deposited from a rapidly retreating ice margin. Ablation till consists of rock debris that were formerly imbedded in or on top of the ice sheet and deposited as the ice melted. Ablation till typically is loose and, therefore, more permeable than till moraine or ground moraine; it is also generally coarser due to the removal of the silt and clay fraction by meltwater.

r BEDROCK--Exposed section of the Utica shale or area where the shale is covered by a veneer of unconsolidated material.

——— - - - CONTACT BETWEEN SURFICAL GEOLOGIC UNITS--Approximately located, dashed where inferred.

A——A' TRACE OF GEOLOGIC SECTION-Geologic sections are shown on sheet 3.

Base from New York State Department of Transportation Clinton, 1978, Oriskany, 1978, Rome, 1978, and Utica West, 1978, 1:24,000 scale

Geology modified from Whipple, 1969; Lowey, 1978; and Cadwell, 1985, by G.D. Casey and R.J. Reynolds, 1987

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds
1988

Sheet 2. Surficial Geology

GEOLOGIC SECTIONS

Hydrogeologic data obtained from drillers' logs, consultants' reports, published reports of the U.S. Geological Survey, and data on file with the U.S. Geological Survey in Albany were used to construct the geologic sections shown here. The sections show stratigraphic relations among the various types of unconsolidated deposits in the Utica area. Because the data were scant, many of the boundaries between various stratigraphic units are inferred. Locations of sections are shown on sheet 2.

STRATIFIED-DRIFT AQUIFERS

Unconsolidated deposits within the Mohawk River valley generally consist of Holocene alluvium underlain by outwash sand and gravel that are in turn underlain by lacustrine silt and clay. This sequence of deposition resulted from the final glacial retreat, followed by occupation of the area by a large glacial lake and subsequent free drainage to the east. Beneath these sediments is a till layer deposited by the last advance of the Oneida sublobe. The till is underlain by sand and gravel deposits that may have been reworked (and deposited) by earlier glacial movement. Ridge and others (1984) concluded that the two episodes of eastward drainage of the proglacial Great Lakes caused fluvial aggradation of sand and gravel in the Mohawk River valley. Most of the sediment originally came from meltwater streams discharging from retreating ice lobes. This sediment was probably reworked by the large volume of water that drained eastward from the proglacial Great Lakes and removed much of the silt and clay, leaving a clean lag deposit of coarse sand and gravel.

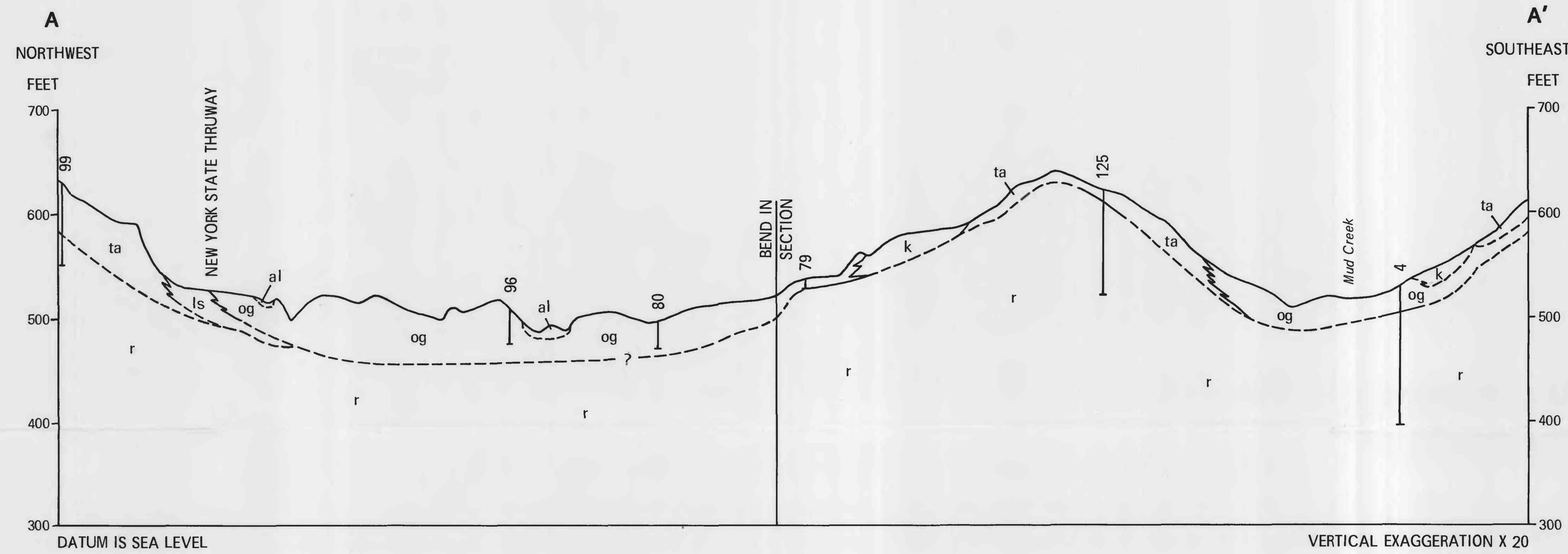
The drift in the tributary valleys is generally a result of the last glacial advance and retreat. The Oriskany Creek and Mud Creek valleys contain variable thicknesses of outwash sand and gravel. The upper reaches of the Saquoit Creek valley contain outwash sand and gravel overlain by a till that represents a small readvance of the ice front during its retreat from the valley.

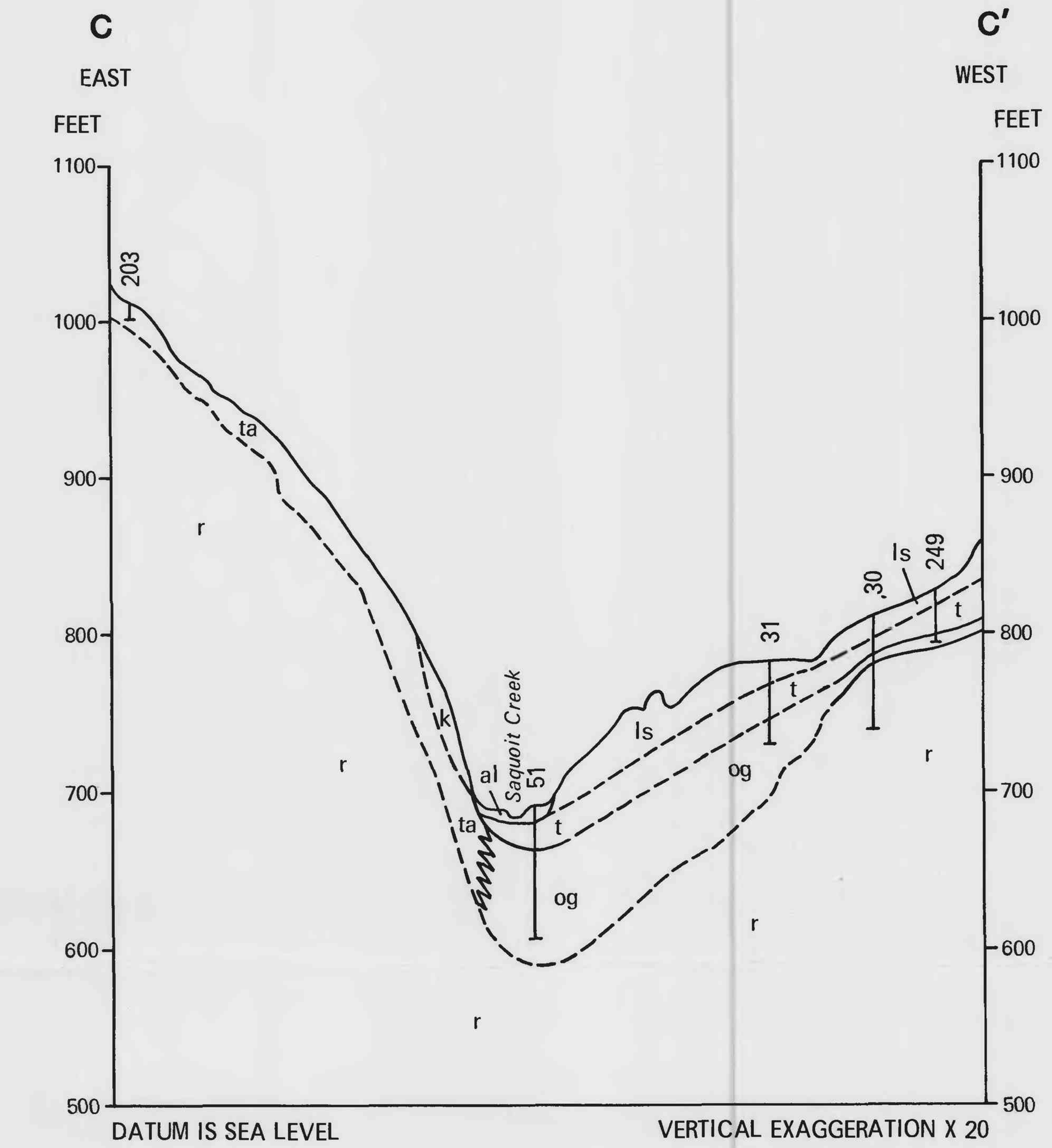
REFERENCE CITED

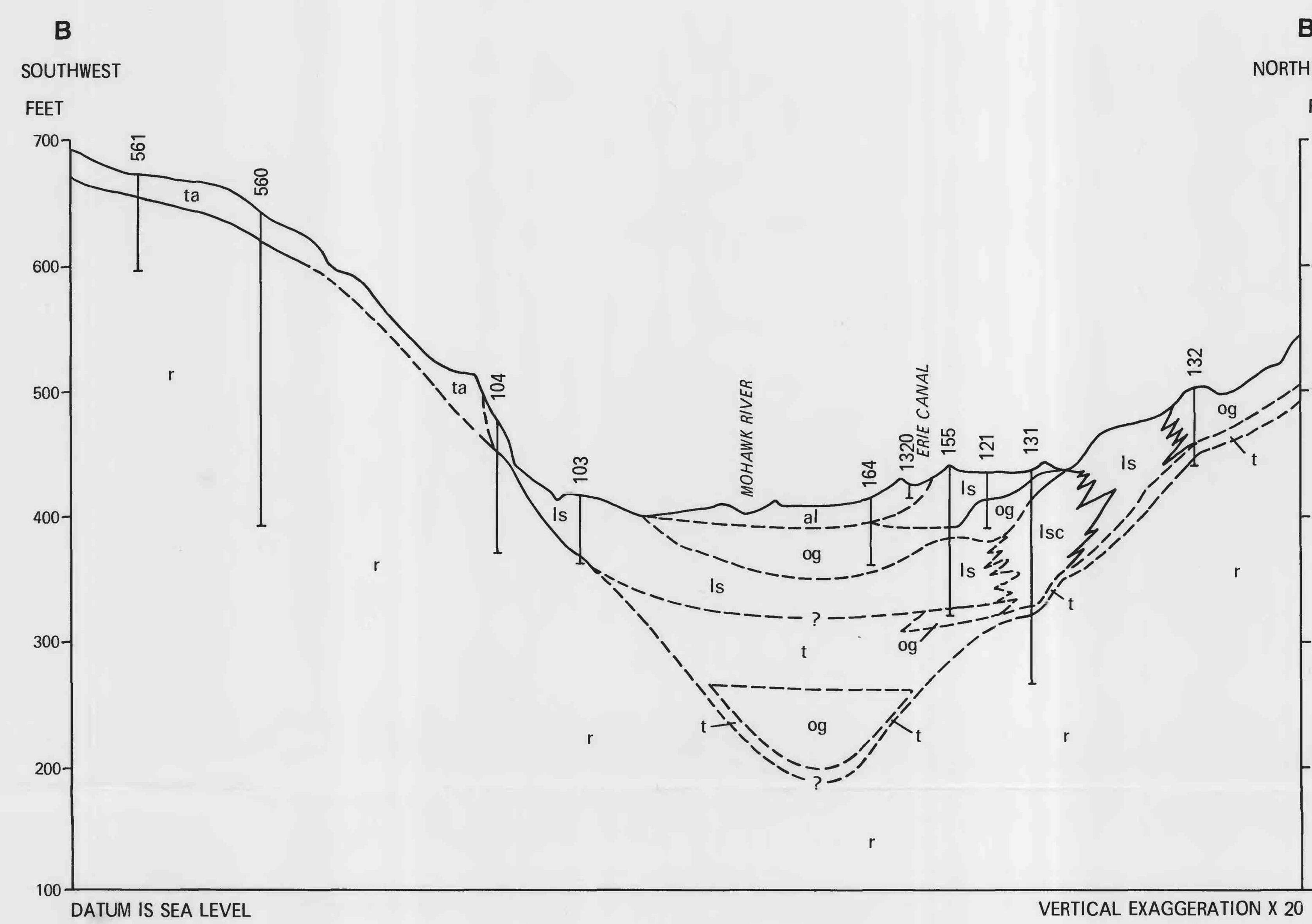
Mueller, E. H., Franzi, D. A., and Ridge, J. C., 1984, The late Wisconsinan glaciation of the West Canada Creek valley, in Potter, D. B., (ed.) Guidebook, New York State Geological Association, 56th Annual meeting, Hamilton, N.Y.: 352 p.

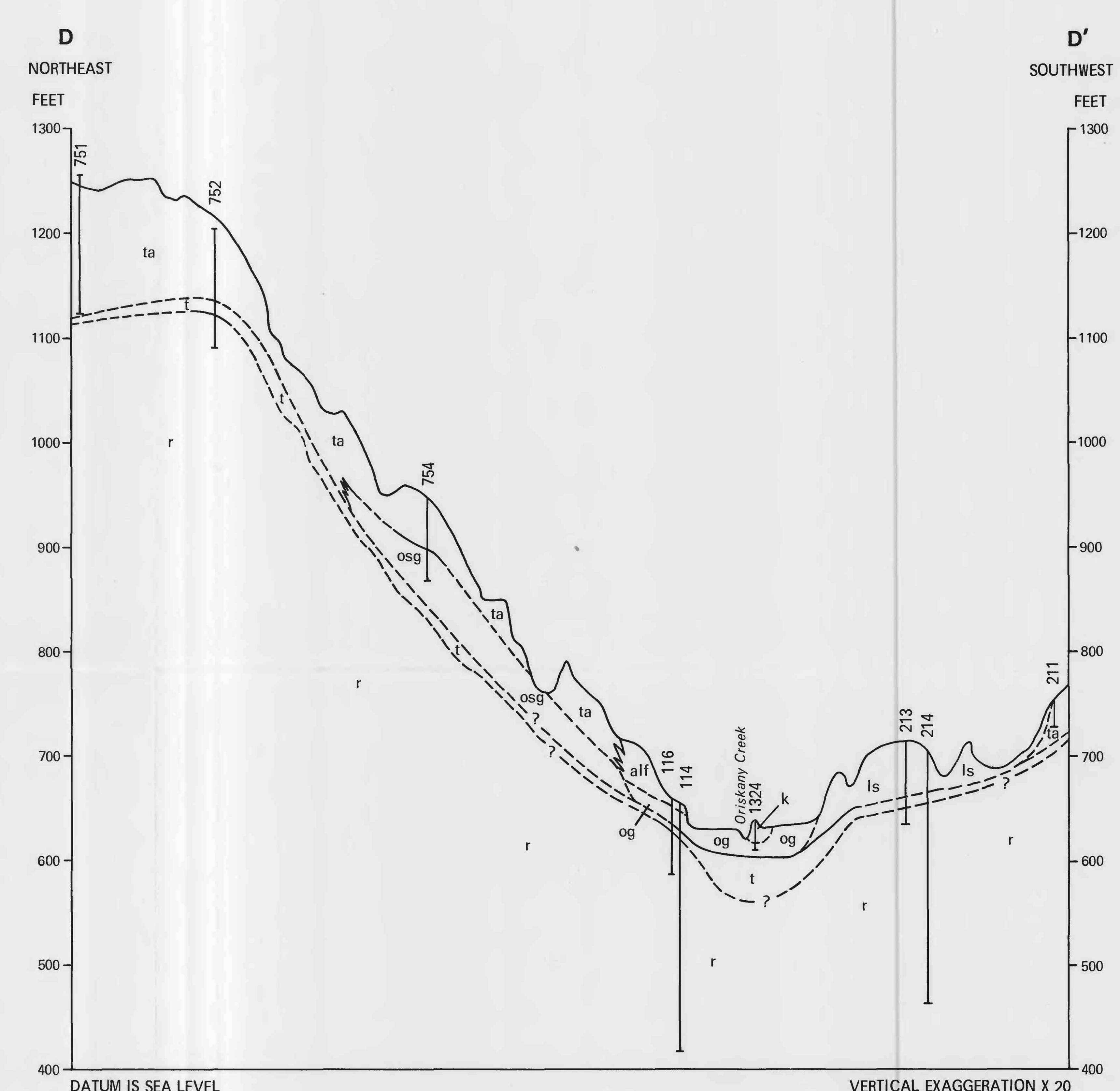
EXPLANATION

al	ALLUVIUM--Postglacial alluvial deposits of silt, fine sand, and some gravel within flood plains. In larger valleys that are subject to frequent flooding, may be overlain by silt of variable thickness. Alluvium is generally moderate to poorly permeable, but is generally underlain by more permeable outwash deposits. Thickness variable but generally less than 30 feet.
lsc	LACUSTRINE SILT AND CLAY--Silt and clay deposited as a bottom sediment in a proglacial lake. Generally composed of calcareous, thinly bedded, laminated beds of silt and clay but can be massive. Variable thickness, up to 300 feet; very low permeability.
ls	LACUSTRINE SAND--Sand, well sorted, stratified, fluvially deposited into a proglacial or postglacial lake in a nearshore, shallow-water environment. Variable thickness, permeable.
og	OUTWASH SAND AND GRAVEL--Stratified sand and gravel deposited by meltwater streams as valley train or as outwash plains and terraces. Highly permeable, well-sorted, coarse to fine gravel with sand. Generally finer-grained as distance from ice border increases. Variable thickness.
k	KAME DEPOSITS--Include kames, eskers, kame terraces, and kame deltas. Ice-contact sand and gravel deposits consisting of fluvially sorted, coarse to fine sand and gravel. Extreme variability in sorting, grain size, and thickness of individual beds. May be locally cemented with calcium carbonate. Variable thickness and permeability; but generally high in coarser, more well-sorted beds.
t	TILL--Ice-contact deposit; unstratified, unsorted mixture of clay silt, gravel, and boulders. Highly impermeable with moderate to high clay content. Thickness variable (up to 150 feet) but generally less than 20 feet in upland areas.
ta	ABLATION TILL--A moraine or sheet of till that was deposited from a rapidly retreating ice margin. Ablation till consists of rock debris formerly imbedded in or deposited on top of the ice sheet and deposited as the ice melted. Ablation till is usually loose and is therefore more permeable than till moraine or ground moraine. It is also generally coarser due to the removal of the silt and clay fraction by meltwater.
r	BEDROCK--Upper Ordovician and Lower Silurian shales and sandstones with a few beds of dolomite.
104	WELL--Well that provided a geologic log used in construction of geologic section. Number is county well number (prefix Oe omitted).
——— — —	GEOLOGIC-UNIT BOUNDARY--Approximate boundary of geologic units, defined as contact between differing sediment types and(or) bedrock. Dashed where approximately located.









0 1 2 MILES
0 1 2 KILOMETERS

TRACE OF GEOLOGIC SECTIONS SHOWN ON SHEET 2

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds

1988

Sheet 3. Geologic Sections

WATER-TABLE ALTITUDE

This map shows the configuration and average altitude of the water table, in feet above sea level, in the surficial stratified-drift aquifer. The map is based on water levels measured at wells that were inventoried by the U.S. Geological Survey during the late 1940's and late 1960's. The altitudes of perennial streams were used to augment well data, mainly in the tributary valleys. In some areas, potentiometric head data from wells finished in bedrock were used to estimate the approximate position of the water table in the surficial sand and gravel aquifer. Water-table contours are drawn with a 10-ft contour interval where water-level and stream altitude data is adequate, while a contour interval of 20 feet was used in areas where data are lacking.

Direction of Ground-Water Flow

Ground water in valley aquifers generally flows downvalley along natural gradients and toward major streams under relatively steep cross-valley gradients. Ground water in the Mohawk River valley in the Utica area flows predominantly cross-valley (toward the river), with only a small downvalley gradient.

Ground water in the Saquoit Creek valley moves predominantly northward (downvalley). In the upper reaches of the Oriskany Creek valley, the major component of ground-water flow is downvalley, but in its lower reaches it has a stronger cross-valley component, partly because the stream is more deeply incised in this area.

The stratified-drift aquifers in the Saquoit and the Oriskany valleys are connected by two through valleys, both of which contain local ground-water divides that separate ground-water flow in the Oriskany valley from that in the Saquoit valley. Because the gradients in this area are shallow and shift in response to local fluctuations in recharge, the locations of these divides are inferred.

EXPLANATION

○ 535 WELL--Shallow well that taps stratified-drift aquifer and yielded water-level data. Number is water-table altitude, in feet above sea level.

● 510 WELL--Well that taps bedrock aquifer and yielded potentiometric head data. Number is altitude of potentiometric surface of bedrock aquifer, in feet above sea level.

—— 570 —— WATER-TABLE CONTOUR--Shows water-table altitude in the stratified-drift (water-table) aquifer. Contour interval 10 feet where data permit, otherwise 20 feet. Datum is sea level.

←—— DIRECTION OF GROUND-WATER FLOW--Shows general direction of ground-water flow in the surficial stratified-drift aquifer.

— — — — GROUND-WATER DIVIDE--Shows inferred location of water-table divide.

———— AQUIFER BOUNDARY--Approximate limit of stratified-drift aquifer.

Base from New York State Department of Transportation Clinton, 1978, Oriskany, 1978, Rome, 1978, and Utica West, 1978, NY, 1:24,000 scale

Hydrogeology by R.J. Reynolds and G.D. Casey, 1987

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds
1988

Sheet 4. Water-Table Altitude

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER-RESOURCES INVESTIGATIONS REPORT 88-4194
SHEET 5. BEDROCK TOPOGRAPHY

GENERALIZED BEDROCK TOPOGRAPHY

Bedrock in the Utica area consists primarily of two units, the Utica Shale and Frankfort Shale, both of Late Ordovician age. The Utica Shale, overlain by the Frankfort Shale, dips gently to the south-southwest. Both preglacial and postglacial fluvial processes dissected the Silurian sandstones and shales that form the northern margin of the Allegheny Plateau south of Utica (Dale, 1953).

The area was uplifted and tilted before the onset of glaciation, and a drainage divide formed in the bedrock surface near Little Falls, 20 miles east of the study area between the west-flowing Rome River and the east-flowing Mohawk River. The merging of the Rome and Mohawk rivers at this divide during the Pleistocene formed an eastward drainage for meltwater from the glacial Great Lakes that caused downcutting and produced erosional channels in the wide Mohawk bedrock valley.

In this part of the Mohawk valley, the bedrock surface has been downcut to about 200 feet below land surface (about 200 feet above sea level). In contrast, the bedrock surface beneath the tributary valley of the Saquoit, Oriskany, and Mud Creeks ranges from only about 50 to 100 feet below land surface. The scant data from the area near Westmoreland suggest a buried bedrock channel that may be continuous with one that trends northwestward, as suggested by Kantrowitz (1970, pl. 1, section 5).

SELECTED REFERENCES

Dale, N. C., 1953, Geology and mineral resources of the Oriskany Quadrangle: New York State Museum and Science Service, Bulletin 345, 197 p.

Halberg, H. N., 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.

Rickard, L. V., and Fisher, D. W., 1970, Geologic map of New York, Hudson-Mohawk sheet: New York State Science Service Map and Chart Series no. 15, scale 1:250,000.

Kantrowitz, I. H., 1970, Ground-water resources on the eastern Oswego River basin, New York: New York State Conservation Department; Basin Planning Report ORB-2, 129 p.

EXPLANATION

○ <321 ● 375	WELL OR TEST HOLE--Marks location of well or test hole that yielded depth-to-bedrock data. Number is bedrock-surface altitude, in feet, above sea level. A "less than" (<) symbol preceding the number indicates that the well did not penetrate bedrock; thus the number indicates the altitude of the bottom of the well or test hole in unconsolidated material.
—— 500 ——	BEDROCK-SURFACE--Shows altitude of bedrock surface approximately located. Contour interval 50 feet. Datum is sea level.
━━━━	AQUIFER BOUNDARY--Approximate limit of stratified-drift aquifer.

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds

1988

Sheet 5. Bedrock Topography

SATURATED THICKNESS OF UNCONSOLIDATED DEPOSITS

This map depicts the total saturated thickness of the unconsolidated valley-fill material, which includes sand, gravel, lacustrine silt, clay, and till. The saturated thickness shown here includes deeper outwash deposits in the Mohawk River valley, which are separated from the upper aquifer by a layer of till. In many areas, the extent and distribution of permeable and impermeable materials are uncertain due to a lack of data; consequently, lines of equal thickness in these areas are inferred.

The Mohawk River valley proper contains two stratified-drift aquifer systems--a confined aquifer that consists of clean sand and gravel overlain by a till, and a surficial unconfined aquifer composed of outwash sand, gravel, and lacustrine and fluvial sand that is interbedded with lacustrine silt and clay. The confined aquifer has an average thickness of about 75 feet; it is thickest in the center of the valley and thins toward the valley walls. The unconfined aquifer, which is the aquifer of primary interest in this area, ranges from 20 to 75 feet in thickness. On the Mohawk River flood plain it is covered by a veneer of recent alluvium. This flood plain was once covered by a proglacial lake; tributary streams now enter it where meltwater streams once deposited sand that now ranges from 20 to 100 feet in thickness.

The Saquoit Creek valley contains outwash sand and gravel and lacustrine sand deposits overlain in places by recent alluvium and till. These deposits have a saturated thickness of 20 to 80 feet and are thickest in the center of the valley and thin near the valley walls. The aquifer material in the Oriskany Creek valley is primarily outwash and ice-contact sand and gravel. These deposits range in saturated thickness from 20 to 60 feet in the upper reaches of the valley and thicken to approximately 200 feet downstream near the Mohawk River valley.

EXPLANATION

●12 WELL OR TEST HOLE--Source of hydrogeologic data for construction of saturated-thickness map. Number shown is total saturated thickness of sediments (undifferentiated). The "greater than" (>) symbol preceding a number indicates that the well did not reach bedrock; thus, the saturated thickness at that location is greater than the value shown.

—— 40 —— LINE OF EQUAL SATURATED THICKNESS--Shows lines of equal saturated thickness of the valley-fill sediments (undifferentiated). Approximately located. Interval 20 feet in most areas, 10 feet where data permit.

——— AQUIFER BOUNDARY--Approximate limit of valley-fill aquifer.

Base from New York State Department of Transportation
Clinton, 1978, Oriskany, 1978, Rome, 1978, and Utica West, 1978, NY, 1:24,000 scale

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds
1988

Sheet 6. Saturated Thickness of Unconsolidated Deposits

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

GENERALIZED SOIL PERMEABILITY

This map classifies the soils of the area as to the approximate rate at which water passes vertically through the A and B horizons (generally less than 30 inches) of the soil profile. The values are given in relation to the less permeable soil horizon (A or B) as determined from infiltration rates obtained in recent soil surveys of Oneida and Herkimer Counties.

Soil permeability does not always coincide with surficial geologic units. Soils that developed on the valley floor of the Mohawk River are derived mainly from fine-grained flood-plain alluvium and, although moderately permeable, they may retard infiltration into the more permeable underlying outwash deposits. The outwash deposits that form high terraces and have not been covered with a fine-grained alluvium typically have higher permeability than those on the flood plain. Steep, narrow valleys may contain soils with a wide range of permeability, but the area covered by each type may be too small to show at this scale. The upland areas are generally covered with a virtually impermeable, clay-rich till. Steep slopes, which have only a thin soil cover, allow most precipitation to run off as surface flow and thus have extremely low infiltration rates.

SELECTED REFERENCES

Kahl, A. D., Tallarico, V. J., and Shelton, W. L., 1975, Soil survey of Herkimer County, New York, southern part: U.S. Department of Agriculture, Soil Conservation Service, 169 p.

Person, C. S., Feuer, R., and Cline, M. G., 1960, Oneida County Soils: New York State College of Agriculture, 1 sheet, 1:125,000 scale.

EXPLANATION

Number on map	Infiltration-rate classification	Infiltration rate, in inches per hour
1	low	0.06 -0.2
2	moderate	0.2 - 6
3	high	6 - 20

——— SOIL-PERMEABILITY BOUNDARY--Approximately located. Defined as the contact between soils with differing permeabilities.

Base from New York State Department of Transportation
Clinton, 1978, Oriskany, 1978, Rome, 1978, and Utica West, 1978, NY, 1:24,000 scale

Hydrology by G.D. Casey, 1987

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds

1988

Sheet 7. Generalized Soil Permeability

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER-RESOURCES INVESTIGATIONS REPORT 88-4194
SHEET 8. LAND USE

LAND USE

Land outside urbanized areas in or near the Mohawk River valley and its larger tributaries is used mainly for farming, but some forest remains. Throughout the rural area are small hamlets, wetlands, and areas excavated for sand and gravel. The villages of Yorkville, New York Mills, Clark Mills, Clinton, and Oriskany are mostly residential but contain some industrial, commercial, and open lands. The city of Utica is principally residential but uses a larger percentage of land for industrial and commercial endeavors than the other developed areas. The Mohawk River valley is a major transportation corridor and contains a section of the New York State Thruway (I-90), the New York State Barge Canal, and the main east-west rail line. The Mohawk River at Utica has a mean annual discharge of approximately 1,000 cubic feet per second (G. D. Firda, U.S. Geological Survey, oral commun., 1986).

Land use is an important consideration in the development of a ground-water-protection program for this area. The high permeability of the surficial aquifer and relatively shallow depth to water in most places makes ground water in this area susceptible to contamination from surface sources such as landfills, salt-storage stockpiles, hydrocarbon-fuel storage, chemical plants, and other facilities having a potential for contaminant leakage.

The land-use classification shown here is based primarily on 1967-68 data that were published as Land Use and Natural Resources Inventory (LUNR) maps by Cornell University (1968), then updated from New York State Department of Transportation 1:24,000 scale topographic maps.

REFERENCE CITED

Cornell University, 1968, Land use and natural resources inventory (LUNR) map series, Utica west, Clinton, Rome, and Oriskany quadrangle, New York State Cooperative Extension, 4 sheets, 1:24,000 scale.

EXPLANATION

1	INDUSTRIAL--light and heavy manufacturing, petroleum- and chemical-storage facilities
2	EXTRACTIVE--sand and gravel mining (both active and abandoned)
3	COMMERCIAL AND SERVICES--includes urban areas, shopping centers, commercial strip development, communications facilities, and facilities without extensive grounds, such as hospitals, municipal buildings, government centers, schools, and universities.
3a	LANDFILLS--includes both active and abandoned landfills, open dumps, and junkyards
3b	SEWAGE-TREATMENT FACILITIES--land application of sewage; includes settling lagoons, both active and abandoned
4	TRANSPORTATION (land and air)--facilities include limited-access highways, airports, truck and train terminals and yards
4a	TRANSPORTATION (waterways)--includes barge canals, channels, locks, ports, docks, dams, and shipyards
5	FARMLAND (crops and pasture)--icludes both active and inactive agricultural area, and area used for horticulture or domestic livestock
5a	FARMLAND--orchards and vineyards
6	FOREST--includes forest stands exceeding 30 feet in height, and brush, tree, and shrub cover less than 30 feet high; forested public areas; forested recreation areas such as public and private campgrounds, ski resorts, public parks, and also wooded hospital grounds, school campuses and correctional facilities.
7	RESIDENTIAL--includes high-, medium-, low-density residential areas, trailer parks, rural hamlets, estates of 5 acres or more, farm-labor camps, developed shoreline, and commerical strip development that is at least two-thirds residential
8	OPEN LAND--includes open recreation areas and open public areas such as golf courses, hospital grounds, school and college campuses, correctional facilities, and cemeteries
9	WATER AND WETLANDS--includes natural or manmade ponds, lakes, or reservoirs, streams and rivers averaging 100 feet wide or more, bogs and shrub wetlands, wooded wetlands, and marine wetlands
——	LAND-USE BOUNDARY--Approximately located. Defined as a contact between areas of differing land use.

Base from New York State Department of Transportation
Clinton, 1978, Oriskany, 1978, Rome, 1978, and Utica West, 1978, NY, 1:24,000 scale

Land use modified from Cornell University LUNR maps (1968), by G.D. Casey and R.J. Reynolds, 1987

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE UTICA AREA, ONEIDA COUNTY, NEW YORK--PART 1 (WEST)

By
George D. Casey and Richard J. Reynolds

1988

Sheet 8. Land Use