DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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WATER-RESOURCES INVESTIGATIONS REPORT 88-4155
SHEET 2. SURFICIAL GEOLOGY

SURFICIAL GEOLOGY

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

Deglaciation Chronology

In the Wisconsinan stage of the Pleistocene glaciation, the study area was covered by the Ontario glacial lobe, which during glacial retreat formed two major sublobes—the Oneida sublobe, which advanced from the west, and the Mohawk sublobe, which advanced up the Mohawk River valley from the east. As the Oneida sublobe receded to the west and the Mohawk sublobe receded to the east, a proglacial lake formed between them and the northern margin of the Appalachian Plateau, to the south, into which fine-grained sediments settled to form lacustrine deposits. As the Oneida sublobe continued its westward retreat, the Mohawk lobe readvanced westward in what is referred to as the "West Canada readvance" (Ridge, 1985) and deposited a layer of till on the lake deposits. The maximum extent of this readvance is placed to the east of Rome (Ridge, 1985). This final advance of the Mohawk sublobe into the study area was followed by a major eastward recession of the Mohawk sublobe, which resulted in the impoundment of another proglacial lake in the Mohawk River valley that subsequently drained to the south through a col near Cedarville (southeast of the study area). Subsequently, the Oneida sublobe made two successive eastward readvances—the Hinkley readvance, followed by the Barneveld readvance (Ridge, 1985). After the Barneveld readvance, the Oneida sublobe underwent ablation and retreated. The resultant meltwater formed channels between the uplands and the margin of the retreating ice and deposited outwash sand and gravel as terraces along the flanks of South Hill and in the Nine Mile Creek valley. The Stanwix-Sherrill moraine is a series of nearly parallel, discontinuous ridges of kames and till-cored mounds in the southwestern corner of the study area. This morainal feature is difficult to recognize because it has been partly buried by fluvial and lacustrine deposits and dissected by meltwater and recent streams (Wright, 1972). Meltwater from the retreating Oneida sublobe was controlled by conditons to the east of Rome to form a succession of proglacial lakes collectively termed Hyper-Iroquois and Iroquois (Fairchild, 1912). As the lake levels lowered, continuous deposition of lacustrine and fluvial sand formed the Rome Sand Plains.

The other large geomorphic feature is the Camden moraine complex, in the northwestern part of the study area. This feature consists of a series of kame moraines that trend east-west north of the Rome Sand Plains between Taberg (west of the mapped area) and Rome.

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EXPLANATION

- al — ALLUVIUM—Postglacial alluvial deposits of silt, fine sand, and some gravel generally confined to flood plains within a valley. In larger valleys that are subject to frequent flooding, the coarser deposits may be overlain by silt of variable thickness. Generally permeable. Thickness variable but generally less than 30 feet
- alf — ALLUVIAL FAN—Fan-shaped, fluvially deposited accumulations of poorly stratified silt, sand, and gravel at the foot of steep slopes. Generally permeable
- pm — SWAMP DEPOSITS—Postglacial to recent deposits of peat, muck, organic silt, and sand accumulated in poorly drained areas and localized depressions. May overlie marl and lake silts. Thickness generally less than 60 feet
- lb — LACUSTRINE BEACH DEPOSITS—Fluvially deposited, stratified sand and gravel at the shore of a proglacial lake that has since drained. Generally well sorted, well drained, and permeable. May have wave-winnowed lag deposits of gravel. Variable thickness
- ld — LACUSTRINE DELTA—Fluvially deposited, stratified, coarse to fine gravel and sand. Generally well-sorted and deposited by meltwater streams extending into a proglacial lake. Variable thickness
- 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 with increasing distance from ice border. Variable thickness
- k — KAME DEPOSITS—Fluvial ice-contact material consisting of sorted coarse to fine sand and gravel deposited as kames, eskers, kame terraces, and kame deltas. Extreme variability in sorting, grain size, and thickness of individual beds. Locally may be calcareously cemented. Thickness variable. Permeability variable but generally high in coarser, well-sorted beds
- km — KAME-MORAINE DEPOSITS—Poorly sorted ice-contact deposits, primarily of sand and gravel but also with large amounts of silt, clay, and boulder-sized material. Typically composed of the slumped remnants of a formerly continuous outwash plain built on the foot of a rapidly wasting or stagnating ice front. Indicates a temporary stillstand of the ice during deglaciation. Thickness and content variable. Calcite cemented locally. Permeability variable but generally increases with increasing grain size and sorting
- t — TILL—Ice-contact deposit; unstratified, unsorted mixture of clay, silt, gravel, and boulders. Relatively impermeable with moderate to high clay content. Thickness variable (up to 150 feet) but generally less than 20 feet in the upland areas
- ta — ABLATION TILL—A morainal or sheet deposit of till that was deposited from rapidly retreating ice. Ablation till is formed from rock debris formerly embedded in or resting atop of the ice sheet and deposited mainly as the ice melted. Ablation till is typically loose and uncompacted and is therefore more permeable than till; it also tends to be coarser because more of the silt and clay fraction was removed by meltwater
- r — BEDROCK—exposed sections of the Ordovician and Frankfort Utica Shales and Middle Silurian shales, sandstones, conglomerates, and some dolomite, or areas where bedrock is covered by thin layer of unconsolidated material
- og/ls — STRATIGRAPHIC NOTATION—Denotes type of material immediately beneath surficial unit. Surficial unit is to left of slash (/); underlying unit is to the right. Example denotes outwash sand and gravel (og) overlying lacustrine sand (ls). Units may be present at depth; stratigraphic relations shown in geologic sections (sheet 3)
- SURFICIAL-UNIT BOUNDARY—Defined as the contact between differing unconsolidated materials. Dashed where approximately located
- AQUIFER BOUNDARY—Contact between unconsolidated aquifer and bedrock/till uplands
- A—A' TRACE OF GEOLOGIC SECTION—geologic sections are shown on sheet 3

Base from New York State Department of Transportation
Lee Center, 1978, North Western, 1978, Oriskany, 1978, Rome, 1978,
Verona, 1978, and Westernville, 1978, NY, 1:24,000 scale

Surficial geology modified from J. Whipple (1969), unpublished field maps, 1:24,000 scale; Lowey (1983); Wright (1972); and Cadwell (1986), unpublished maps; 1:125,000 scale

CONTOUR INTERVAL 10 AND 20 FEET
DATUM IS MEAN SEA LEVEL

HYDROGEOLOGY OF THE STRATIFIED-DRIFT AQUIFERS IN THE ROME AREA, ONEIDA COUNTY, NEW YORK

By
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1988

Sheet 2. Surficial Geology