DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
TEMPORARY STATE COMMISSION ON TUG HILL
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER-RESOURCES INVESTIGATIONS REPORT 88-4014
PLATE 3B. SURFICIAL GEOLOGY
RICHLAND AND ORWELL QUADRANGLES

EXPLANATION

- w — Open-water areas
- a — Alluvial silt, sand, and gravel; stream deposits of postglacial time; unconsolidated and generally permeable
- pm — Peat, marl, muck, and clay; bog deposits of postglacial to recent time
- as — Eolian sand; wind-deposited sand that form ridges or mounds; fine to medium grained; oxidized and moderately permeable
- lsc — Lake silt and clay; offshore deposits in proglacial or postglacial lakes; thin bedded to massive; low to moderate permeability
- lss — Lake silt and fine sand; offshore deposits in proglacial or postglacial lakes; thin bedded to massive; low to moderate permeability
- dsg — Deltaic sand and gravel; pebble and cobble gravel with sand deposited at the mouths of streams flowing into a lake; well sorted; unconsolidated and highly permeable
- bsg — Beach sand and gravel; coarse sand and gravel deposited near or at shore of proglacial or postglacial lakes; well sorted; unconsolidated and highly permeable
- ksg — Kame, kame-delta, and kame-terrace sand and gravel; coarse sand to cobble gravel distributed on a glacier and later deposited on ground as ice melted; poor sorting; unconsolidated except for some secondary calcite cementation; highly permeable
- osg — Outwash sand and gravel; coarse sand to cobble gravel deposited by streams flowing from former ice sheets; stratified; well sorted; highly permeable
- at — Ablation till; mixture of clay, silt, sand, and boulders deposited from drift laid down after ice melted beneath it; unconsolidated; noncompact and generally slightly coarser than lodgment till; variable permeability. Typically, ablation till overlies lodgment till
- lt — Lodgment till; mixture of clay, silt, sand, and boulders deposited at base of glacier; poorly sorted; compact and impermeable
- r — Bedrock; sedimentary rocks

AQUIFER BOUNDARY--Dashed where valley aquifer is adjacent to permeable material on uplands and valley walls for which there are little data to determine whether deposits are saturated year round. These areas would contribute recharge to the valley aquifer

GEOLOGIC CONTACT--Dashed where approximate

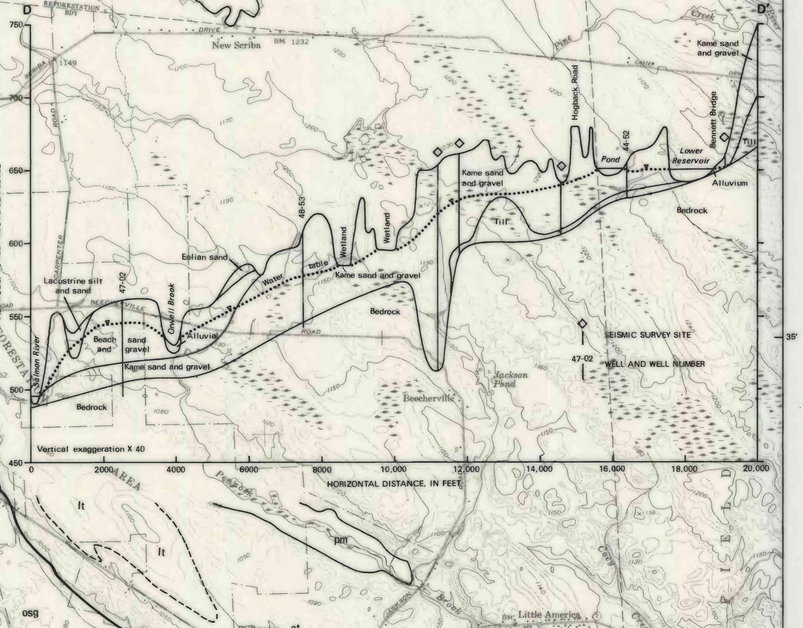
D — D′ LINE OF GEOLOGIC SECTION

AREA OF TILL WITHIN AQUIFER

48-53 Well used to draw geologic section

47-02 Test hole used to draw geologic section

0 ½ 1 MILE
0 ½ 1 KILOMETER



Base from U.S. Geological Survey, 1960; revised by New York State Department of Transportation, Richland and Orwell, 1975, 1:24,000

Geology by T.S. Miller, 1980

HYDROGEOLOGY AND WATER QUALITY OF THE TUG HILL GLACIAL AQUIFER IN NORTHERN NEW YORK

By
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